

Figure 1 User Surrounded by Devices and Services

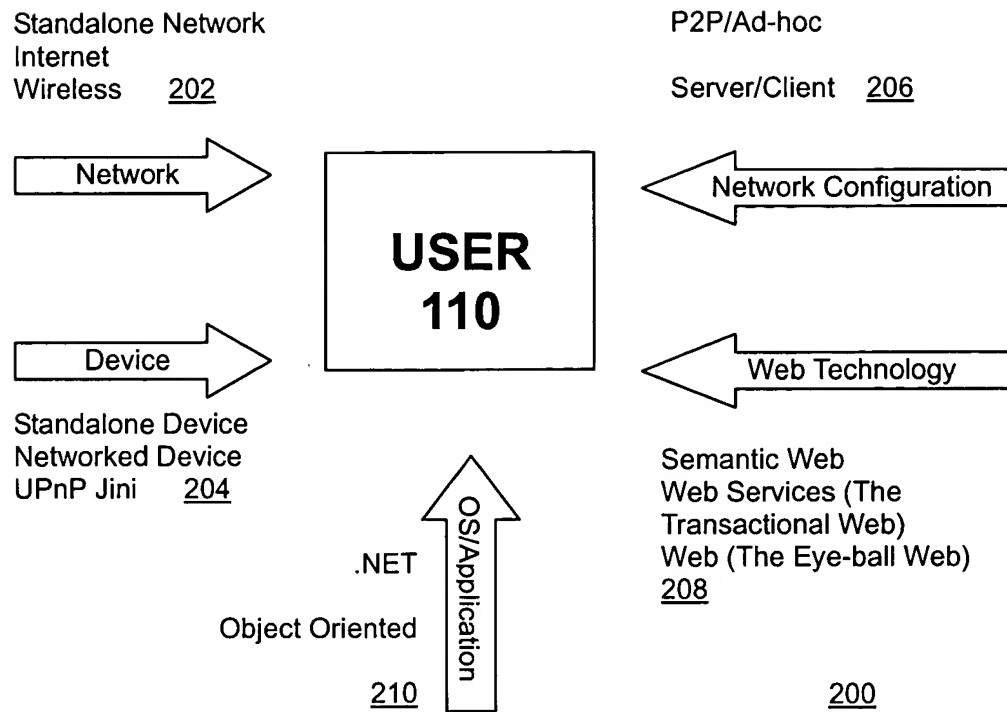


Figure 2 User-centered View (I)

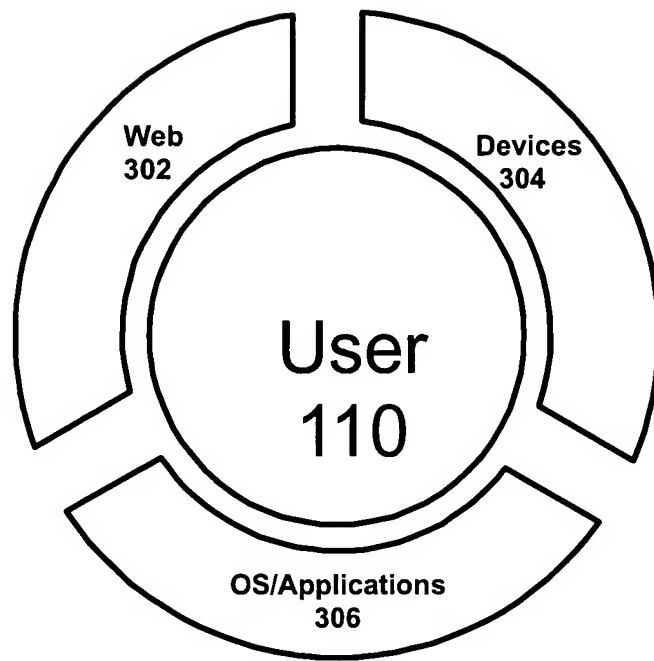


Figure 3 User-centered View (II)

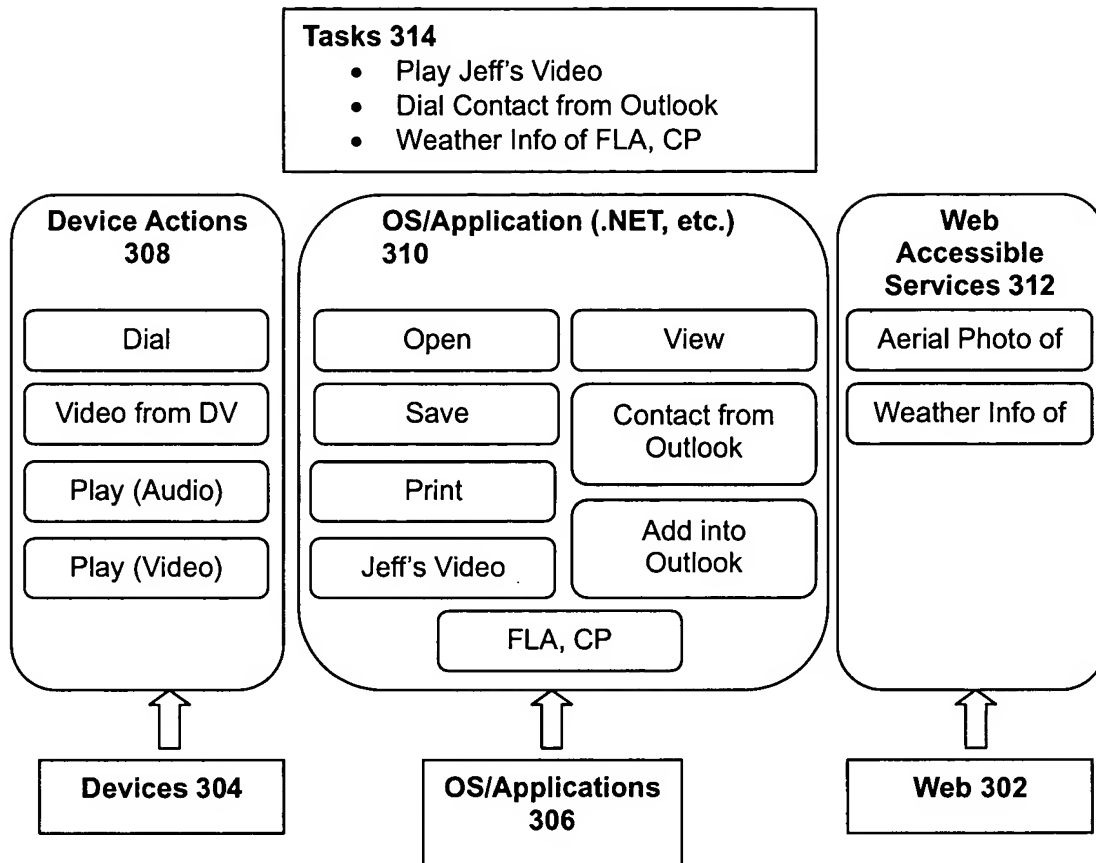


Figure 4 Tasks and Services

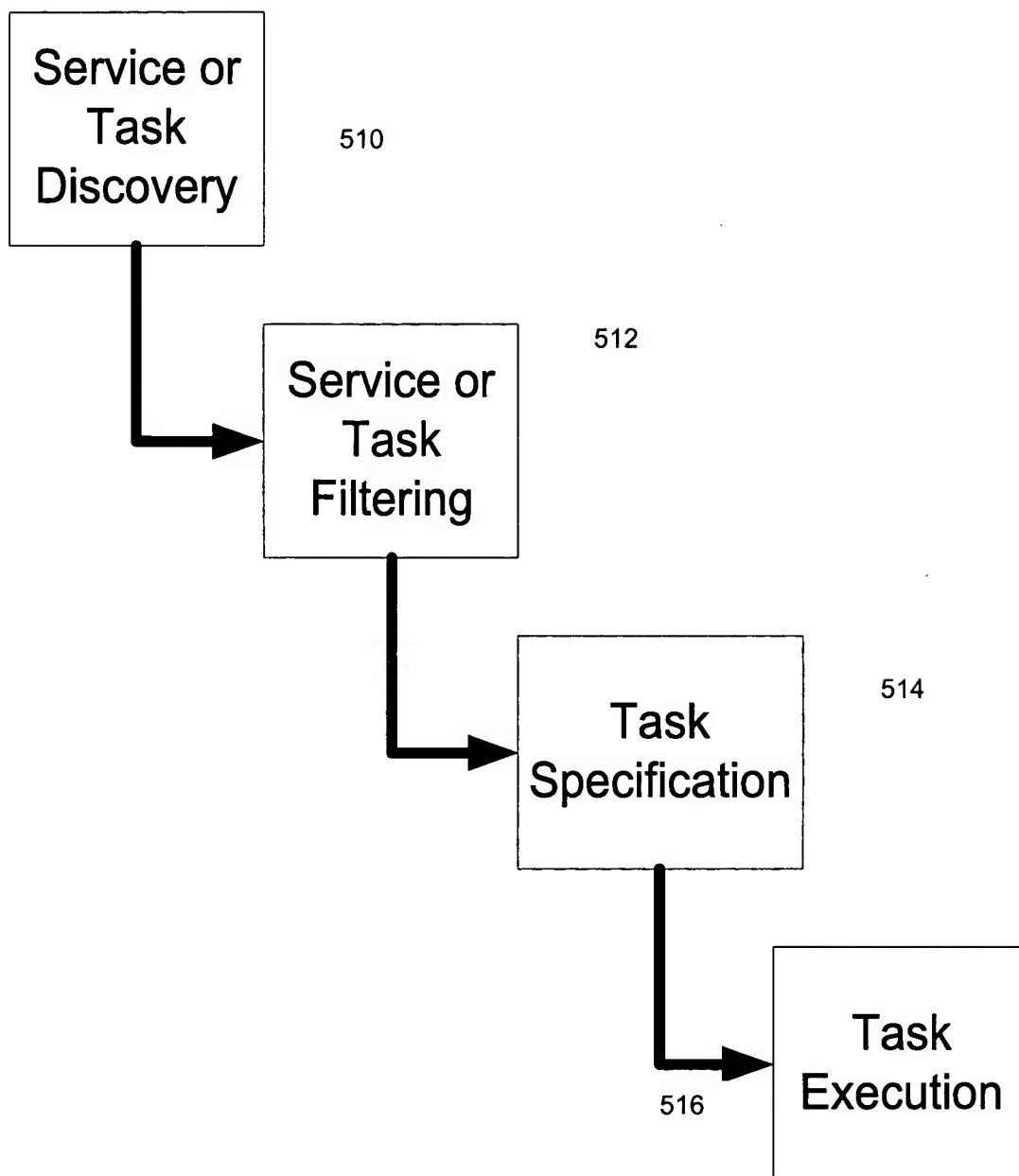


Figure 5 Task Computing Workflow Variation (I) 500

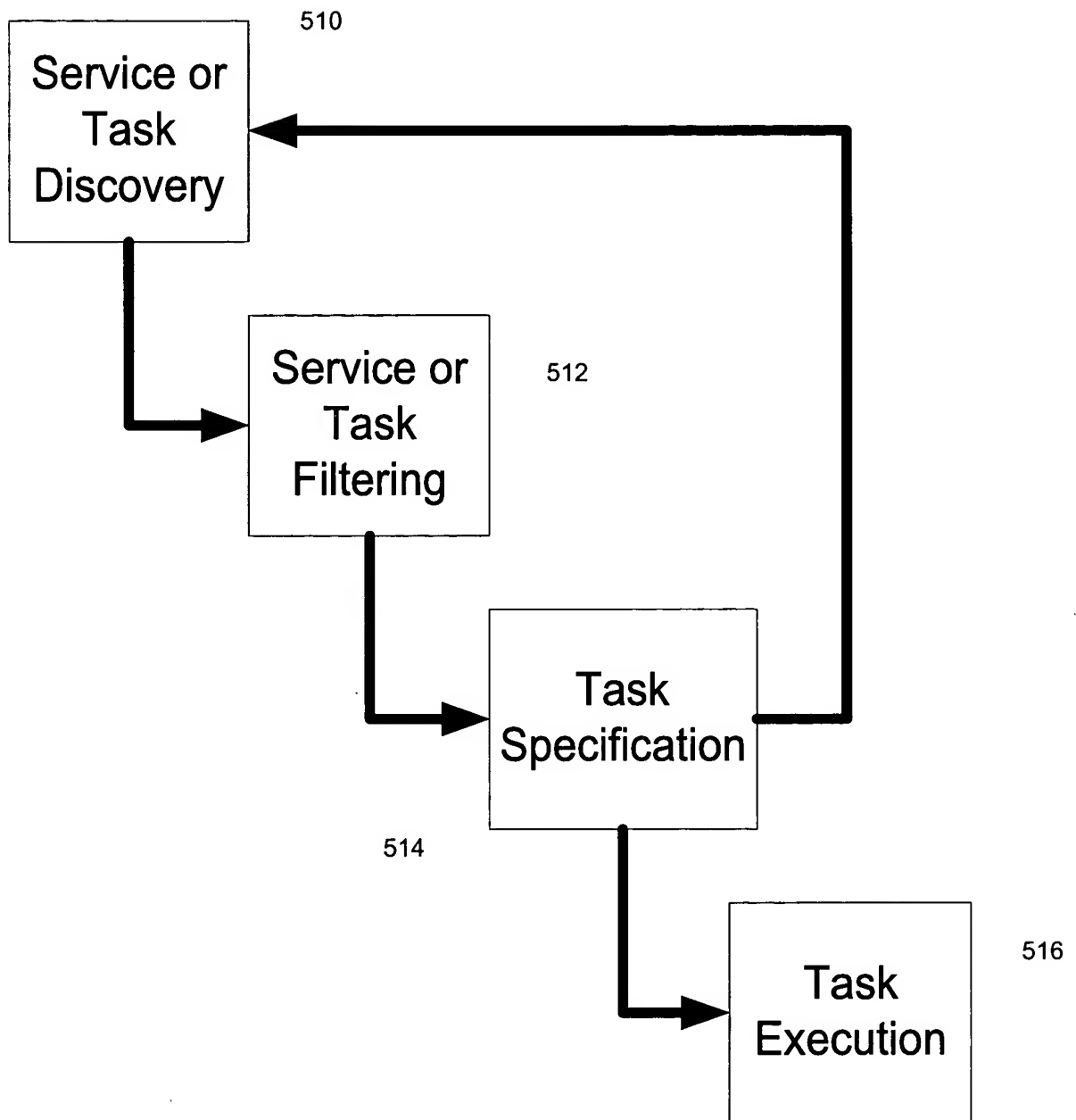


Figure 6 Task Computing Workflow Variation (II) 600

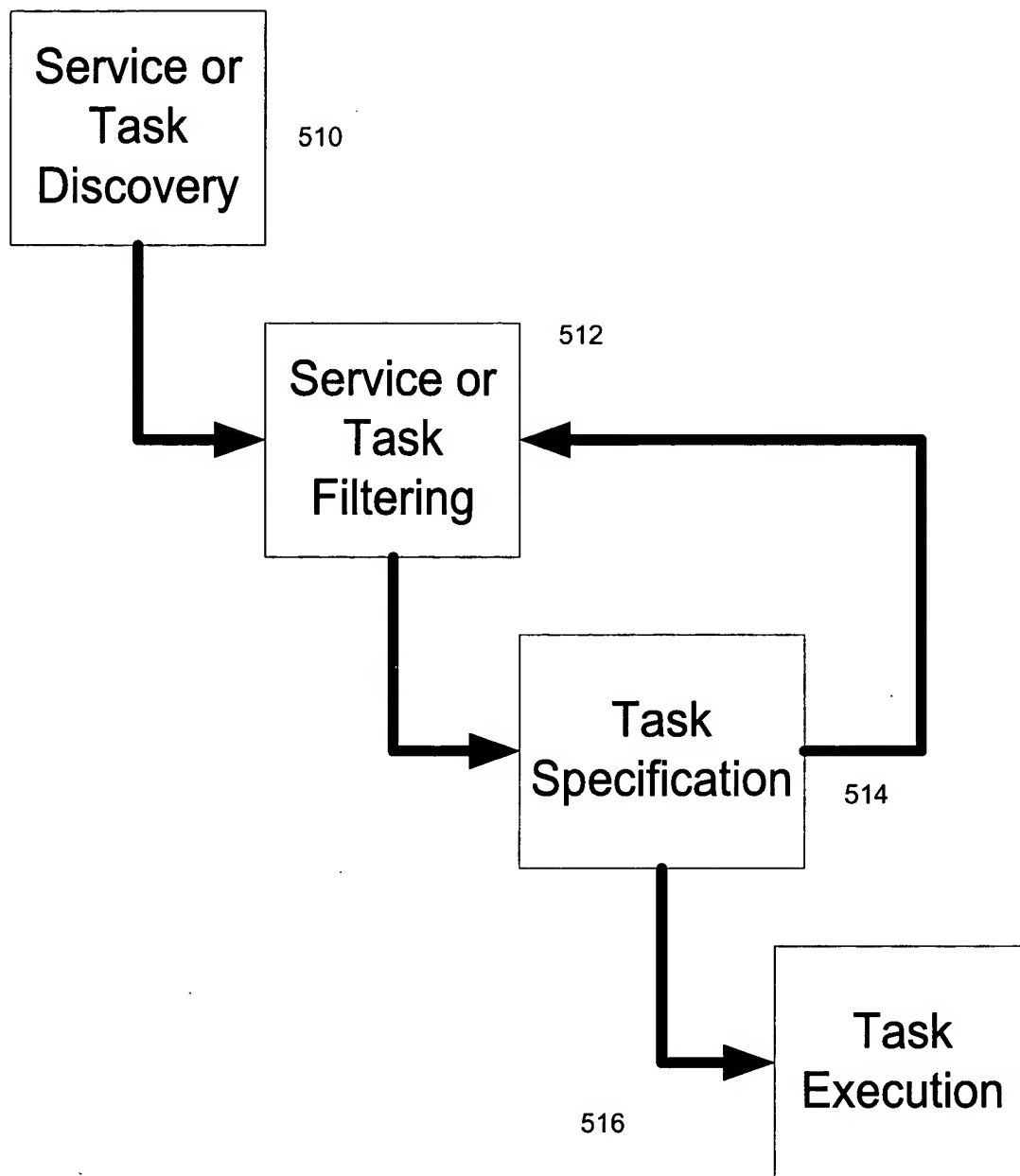


Figure 7 Task Computing Workflow Variation (III) 700

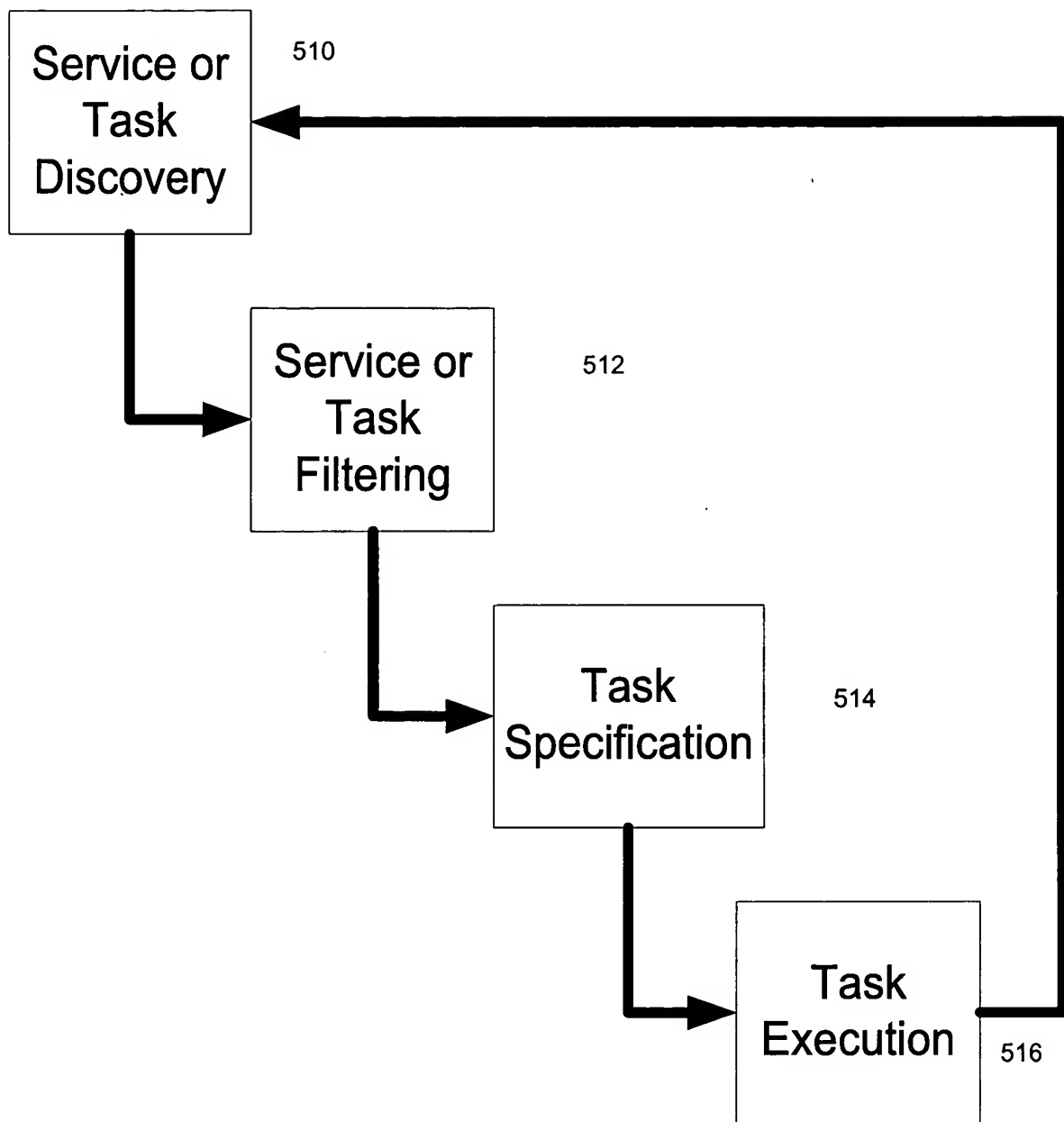


Figure 8 Task Computing Workflow Variation (IV) 800

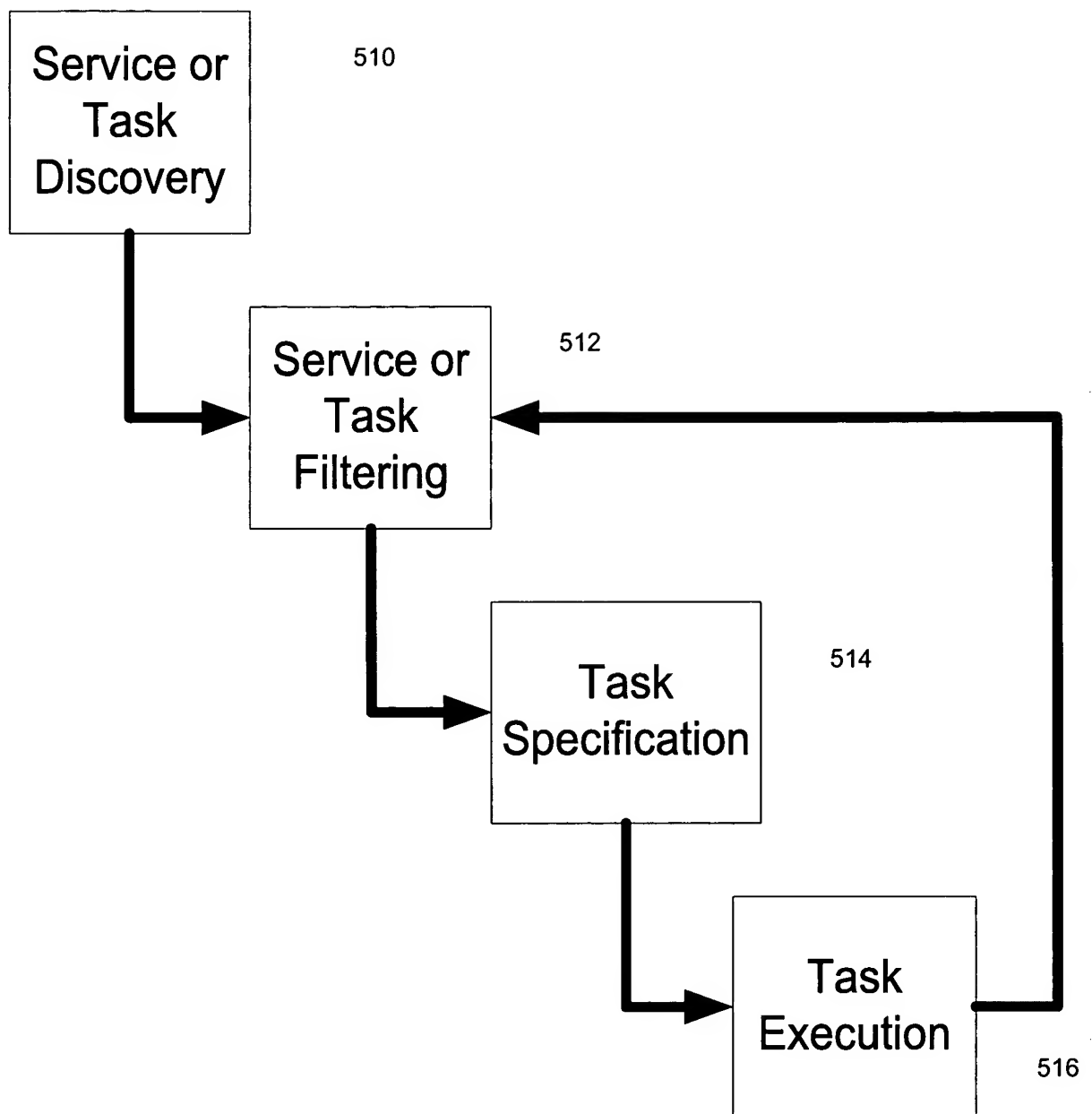


Figure 9 Task Computing Workflow Variation (V) 900

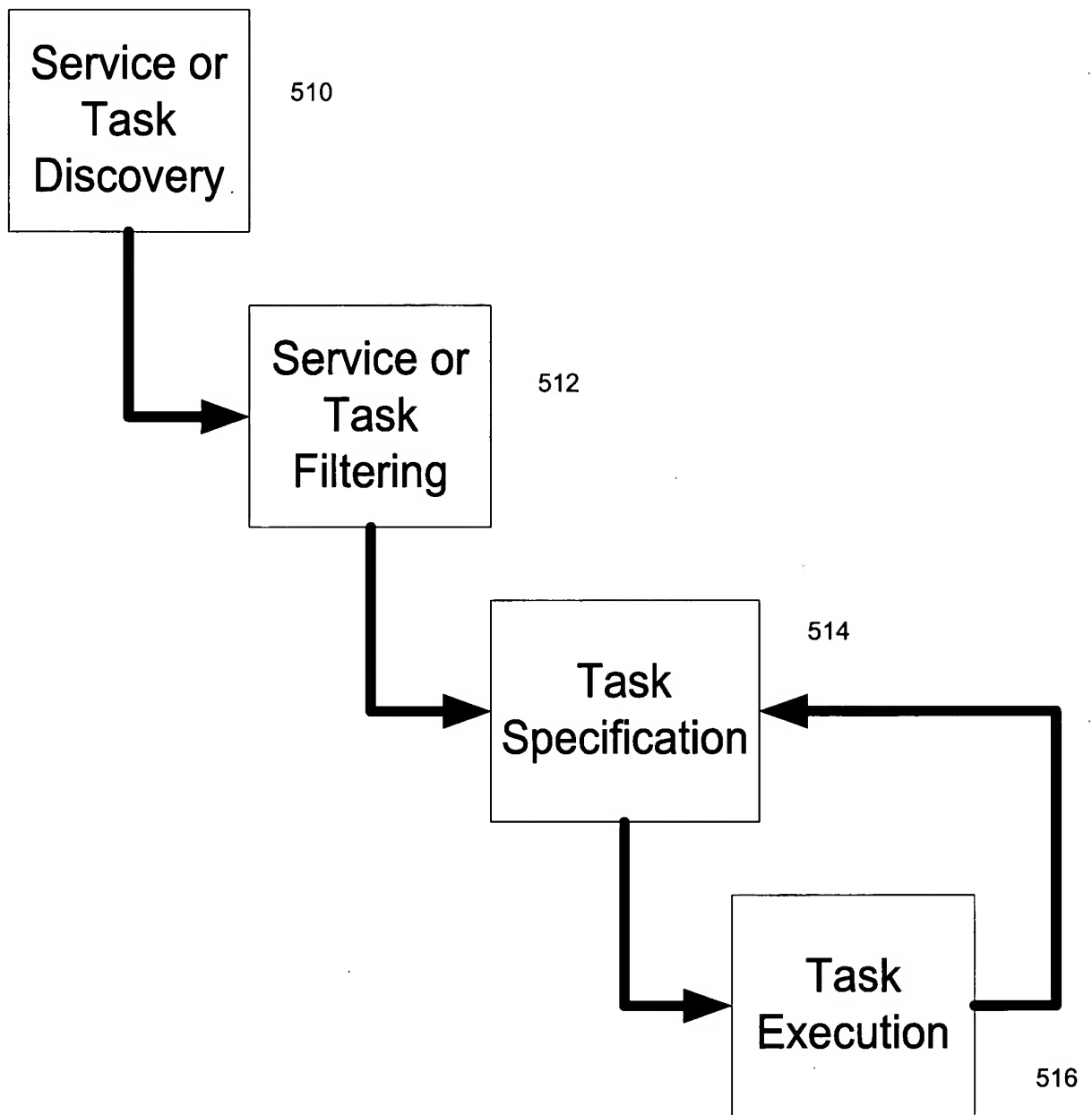


Figure 10 Task Computing Workflow Variation (VI) 1000

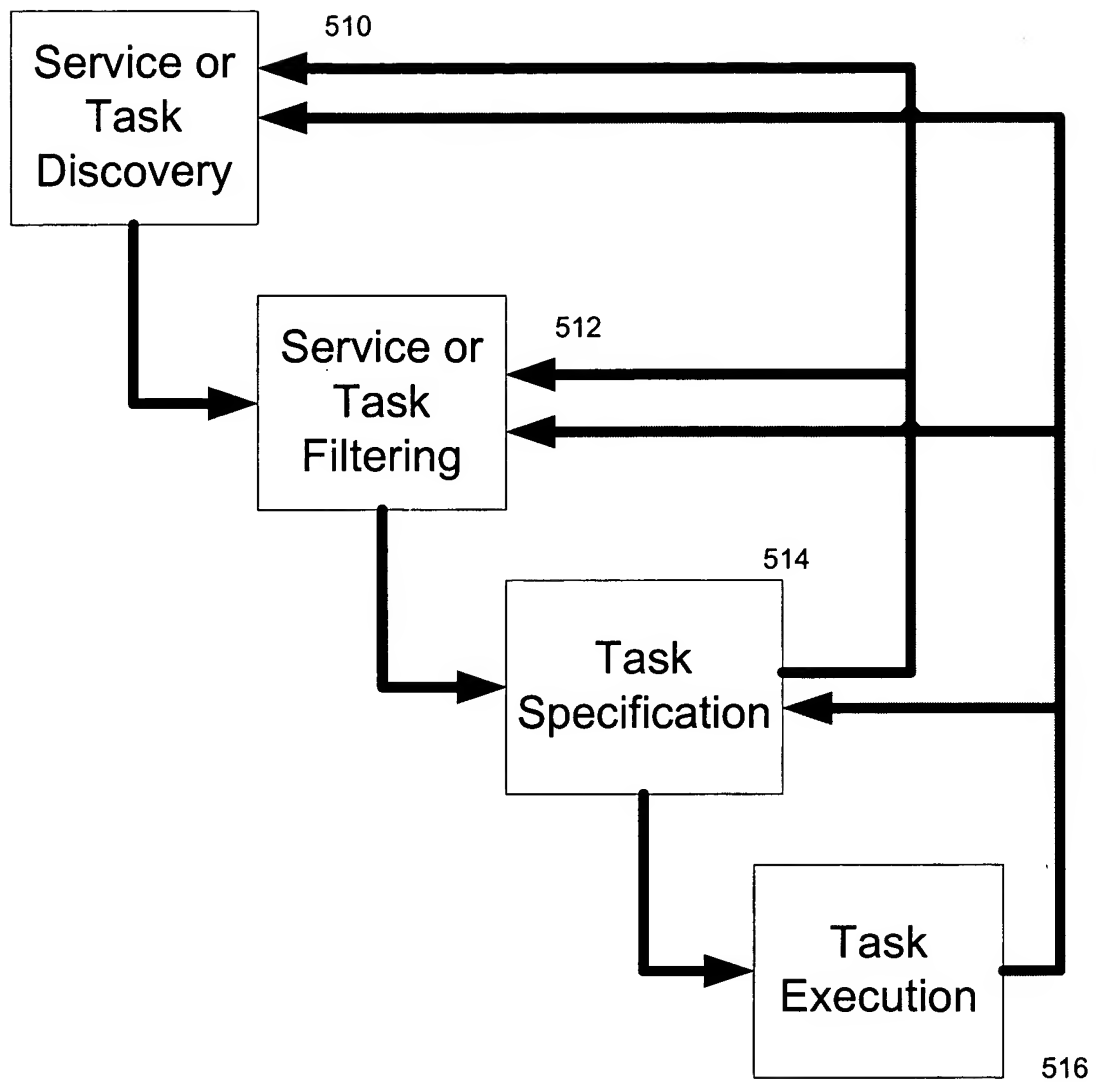


Figure 11 Composite Task Computing Workflow 1100

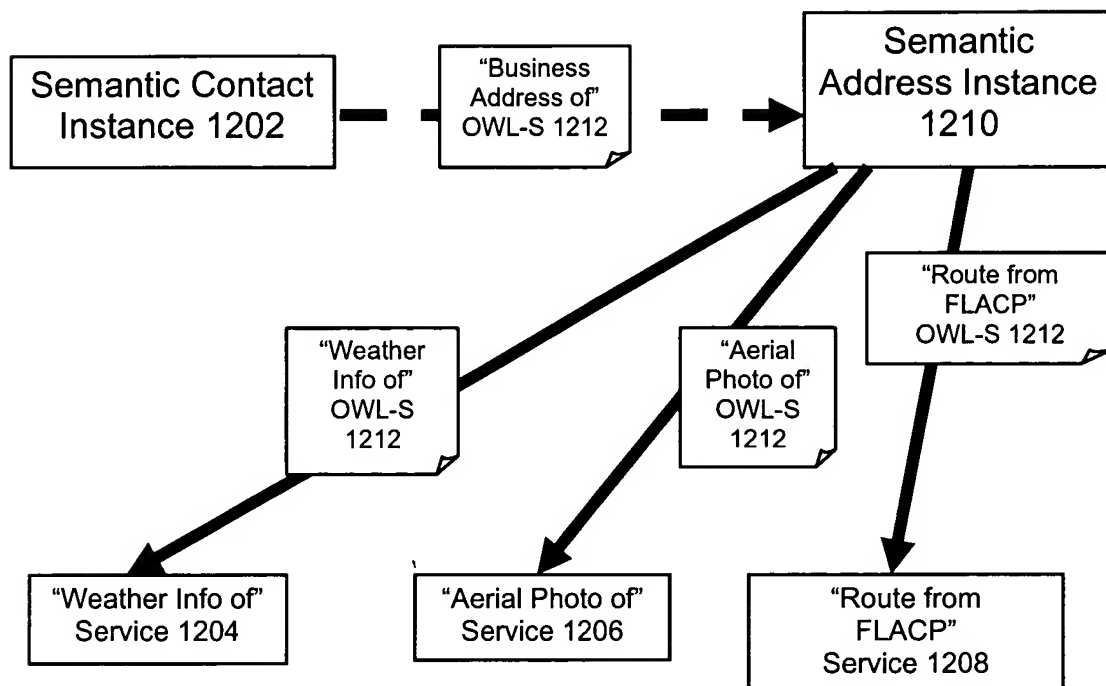


Figure 12 Semantic Service Instance Mapping and Grounding 1200

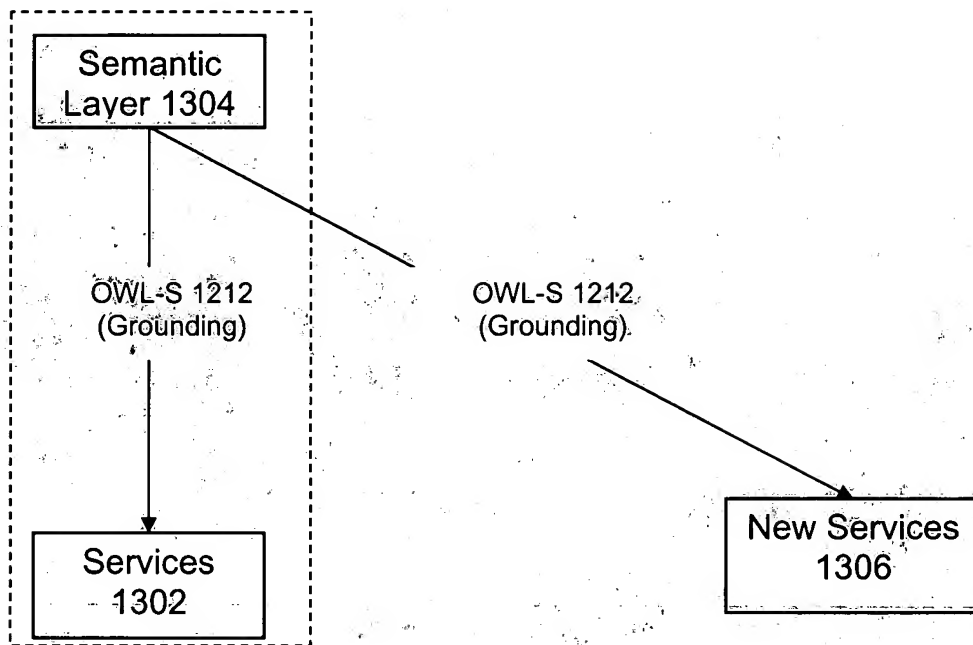


Figure 13 Incorporating New Services (I) 1300

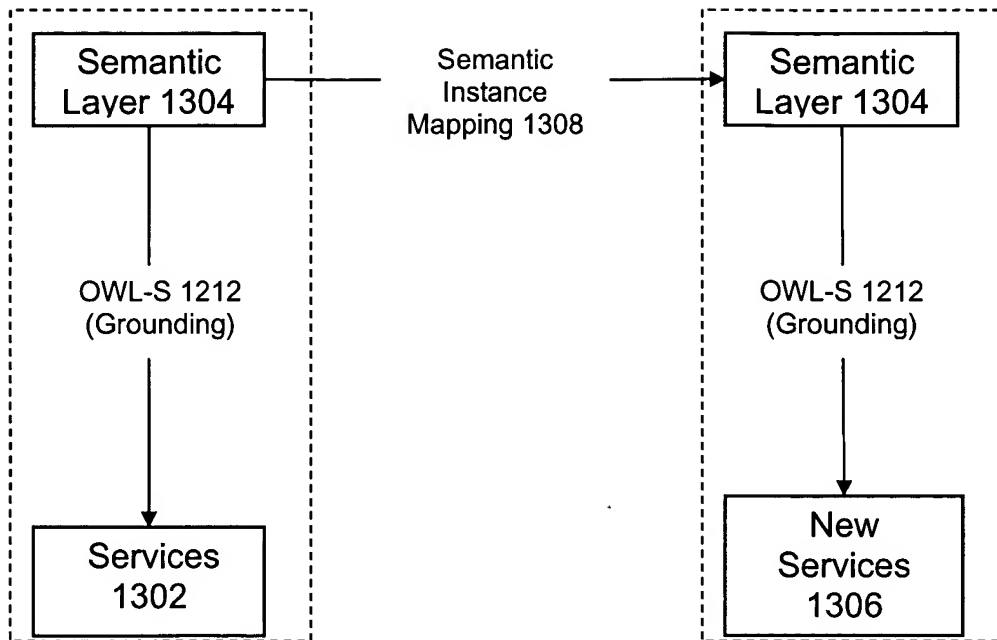


Figure 14 Incorporating New Services (II) 1400

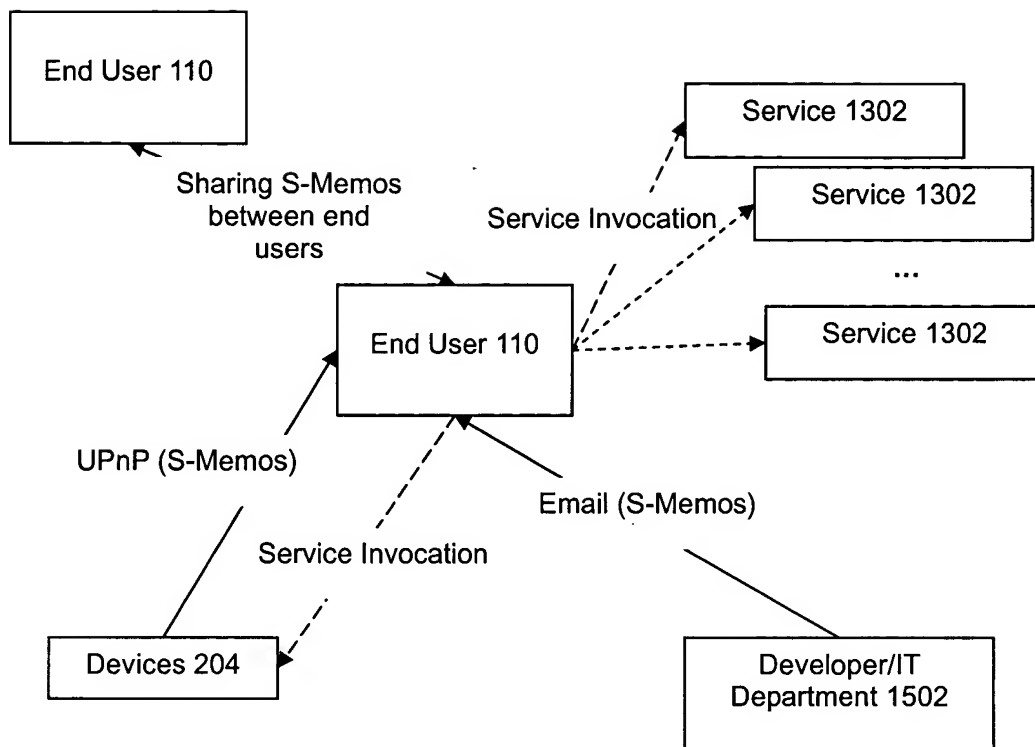


Figure 15 End-user System Development/Deployment Based on S-Memo 1500

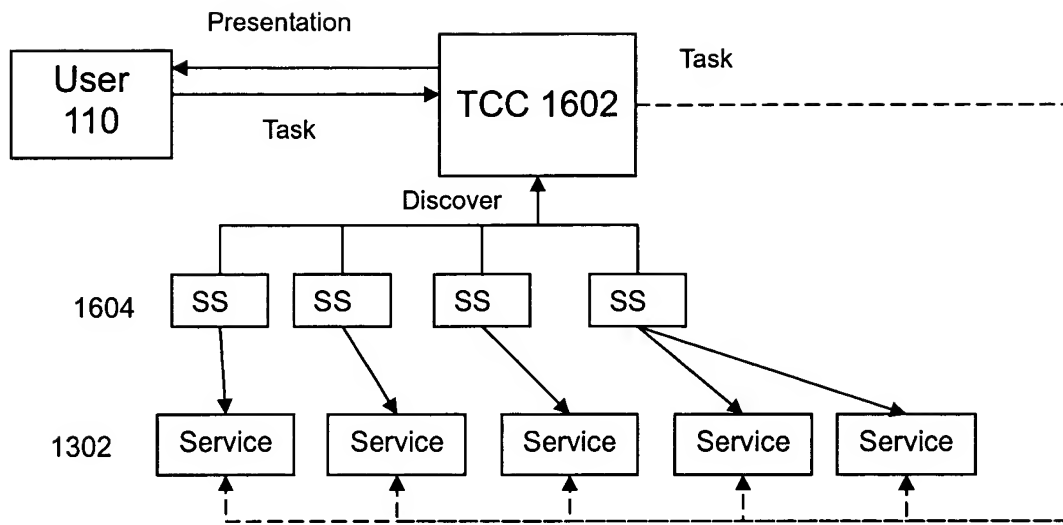


Figure 16 Generic Architecture of a TCE Embodiment 1600

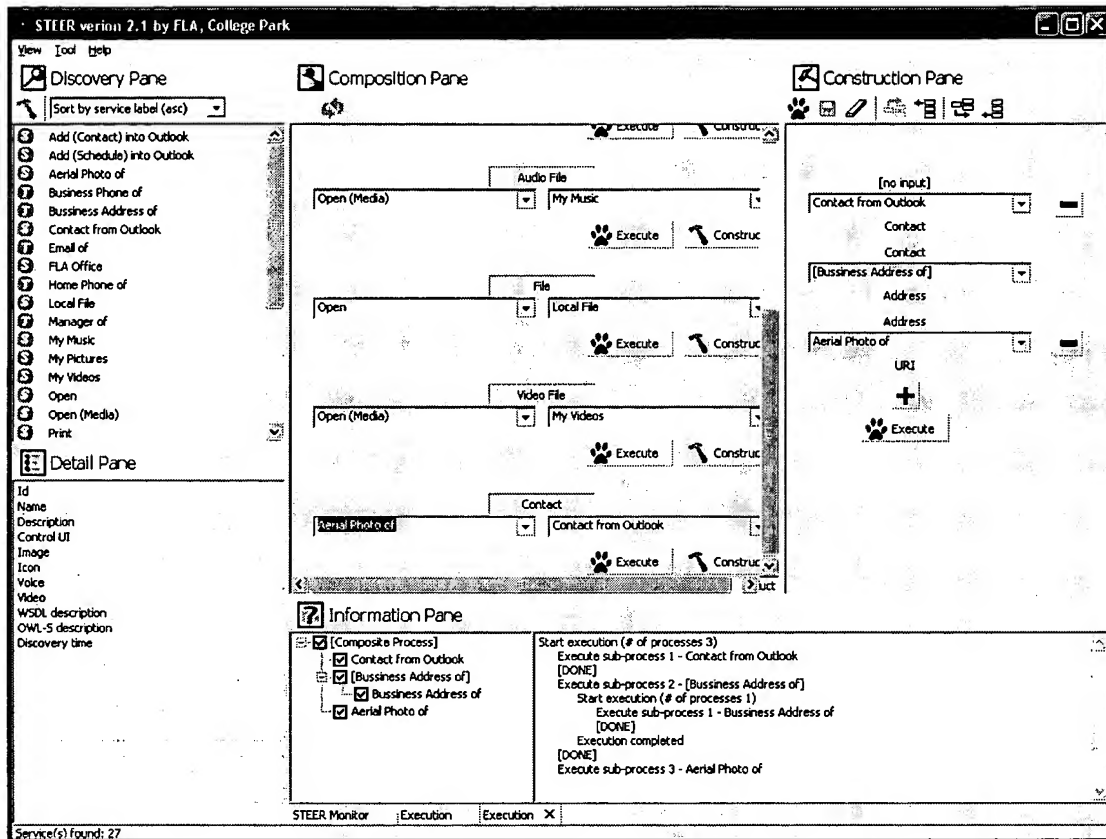


Figure 17 User Interface Full Version 1700

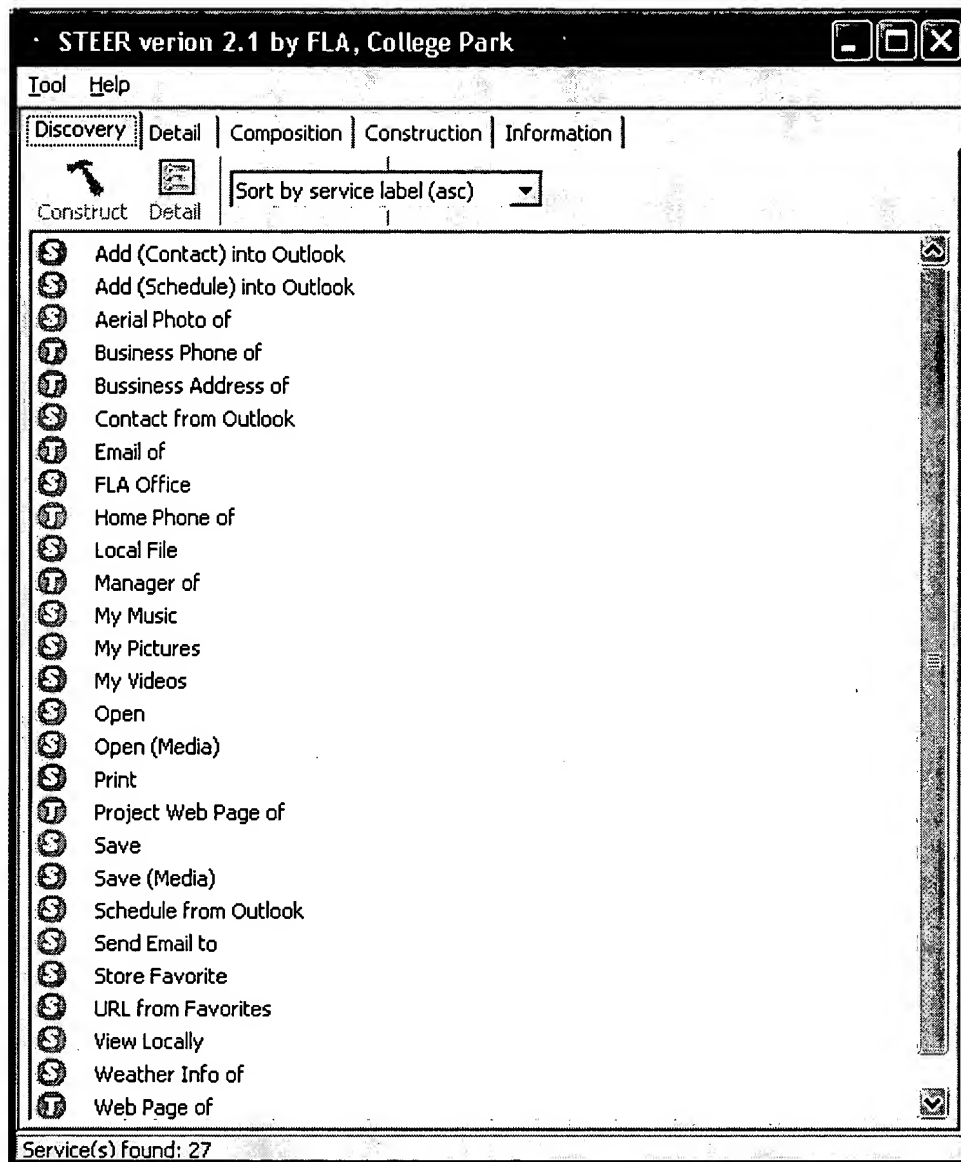


Figure 18 User Interface Tab Version (I) 1800

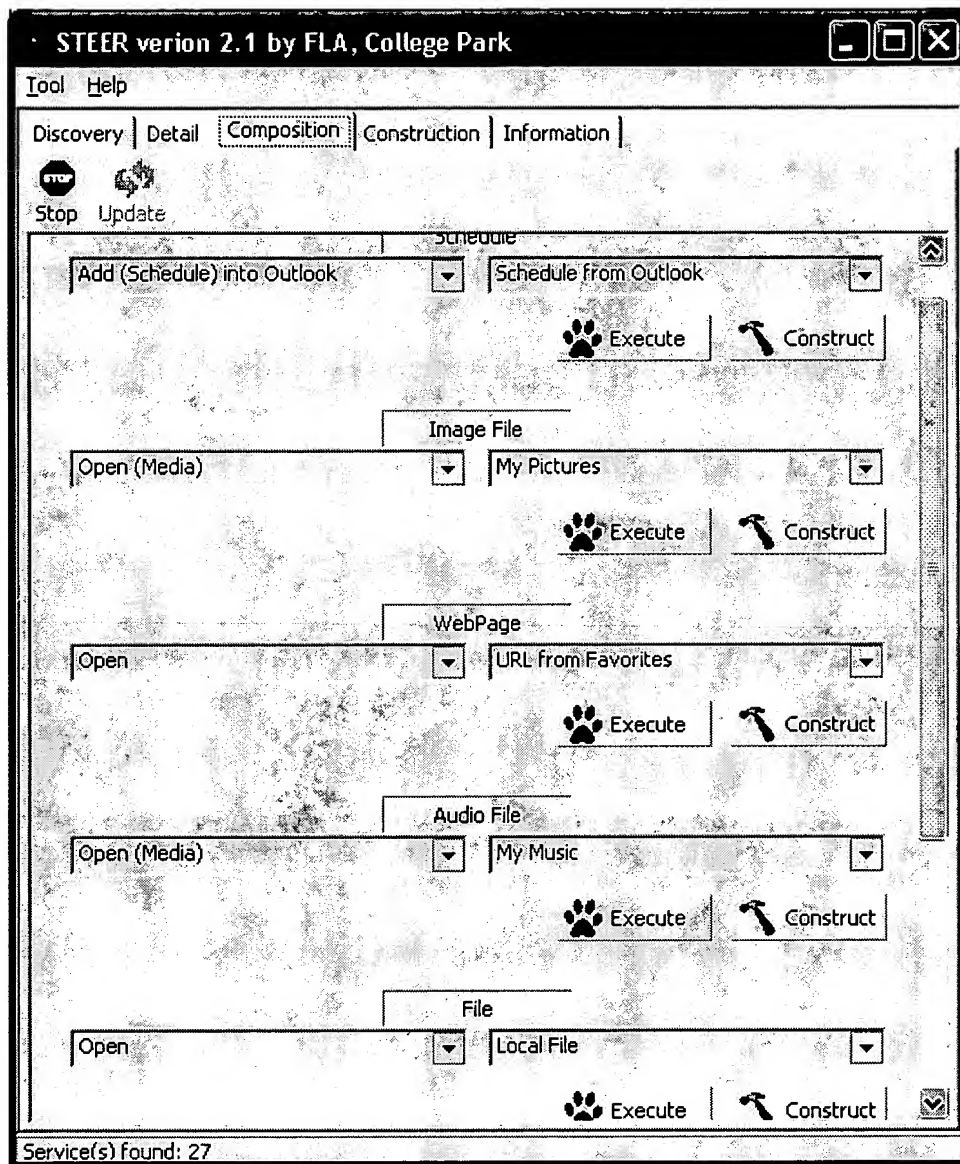


Figure 19 User Interface Tab Version (II) 1900

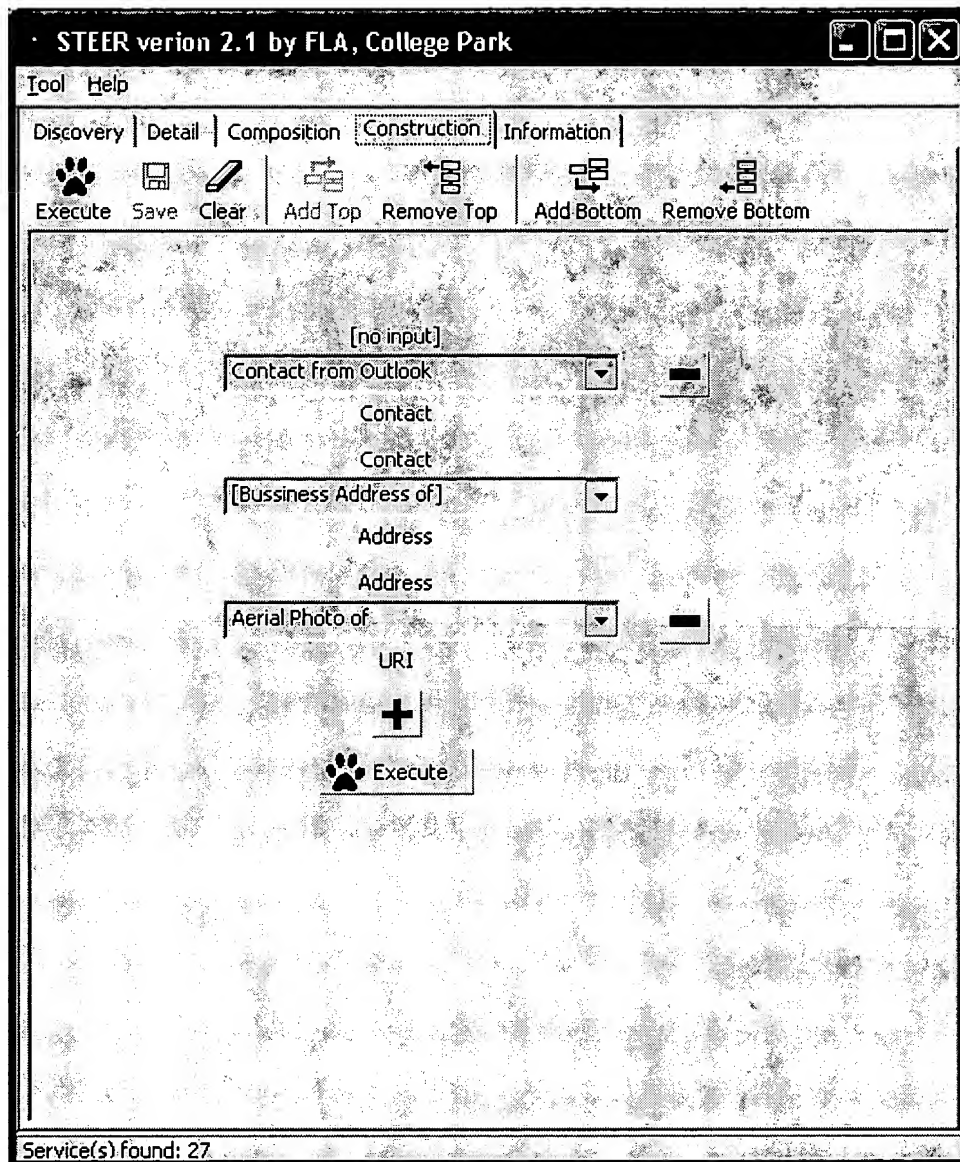


Figure 20 User Interface Tab Version (III) 2000

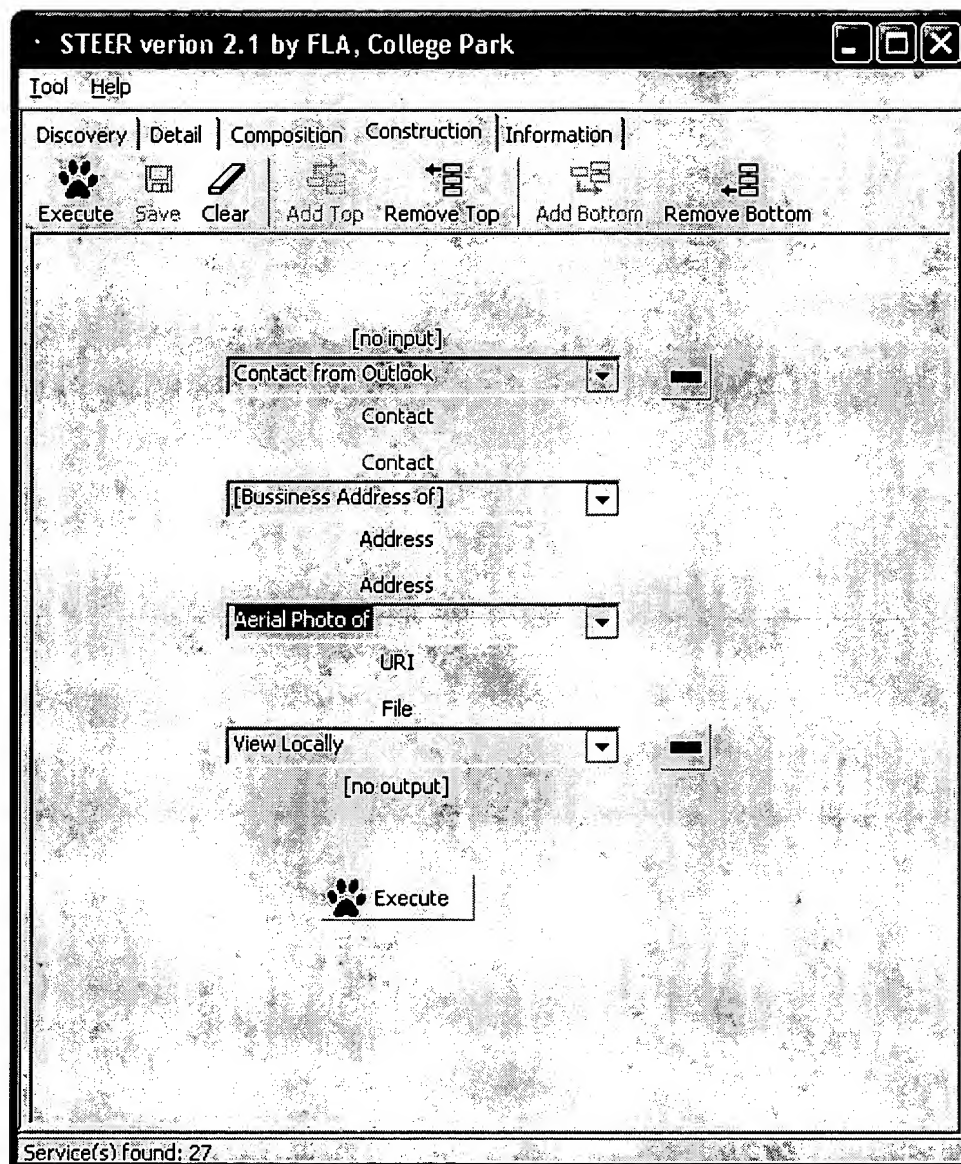


Figure 21 User Interface Tab Version (IV) 2100

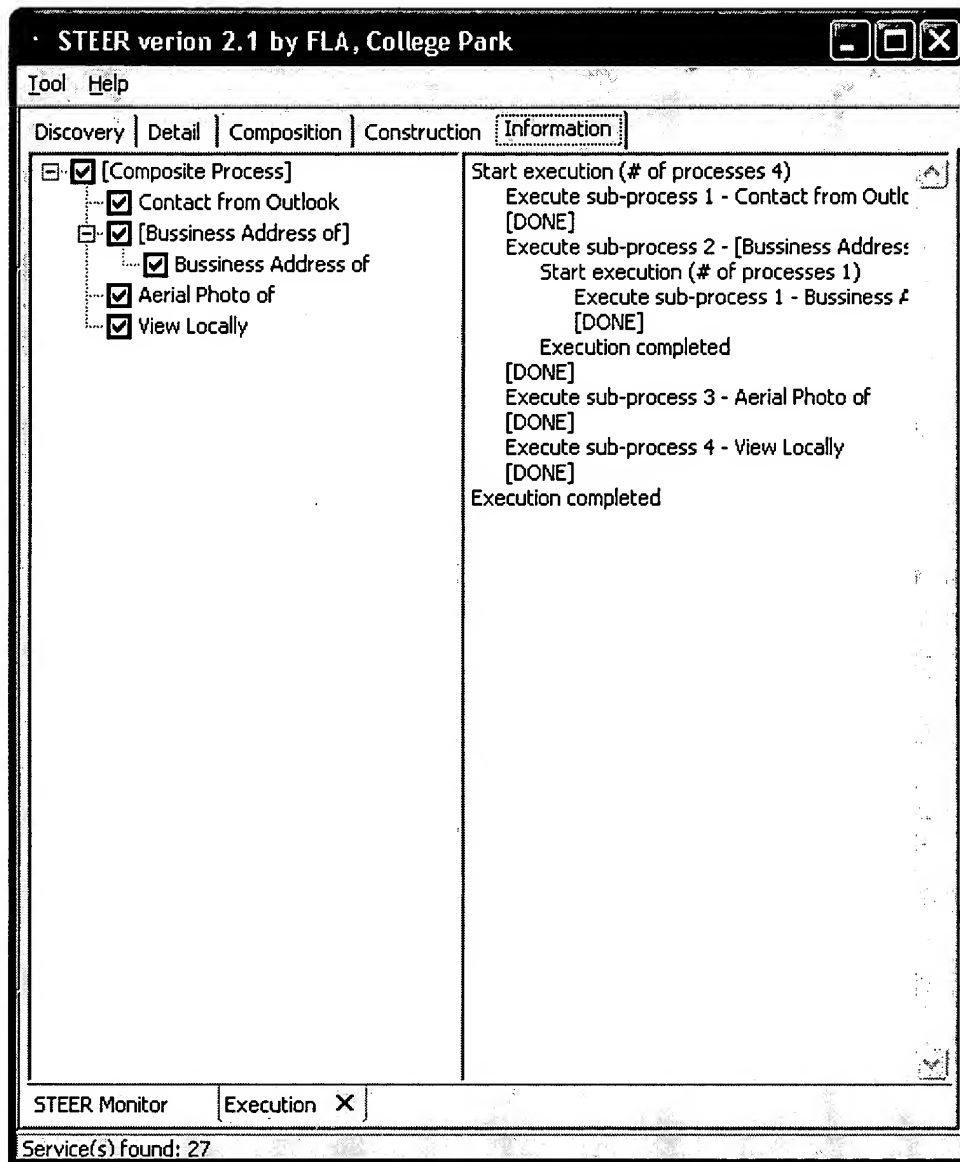


Figure 22 User Interface Tab Version (V) 2200

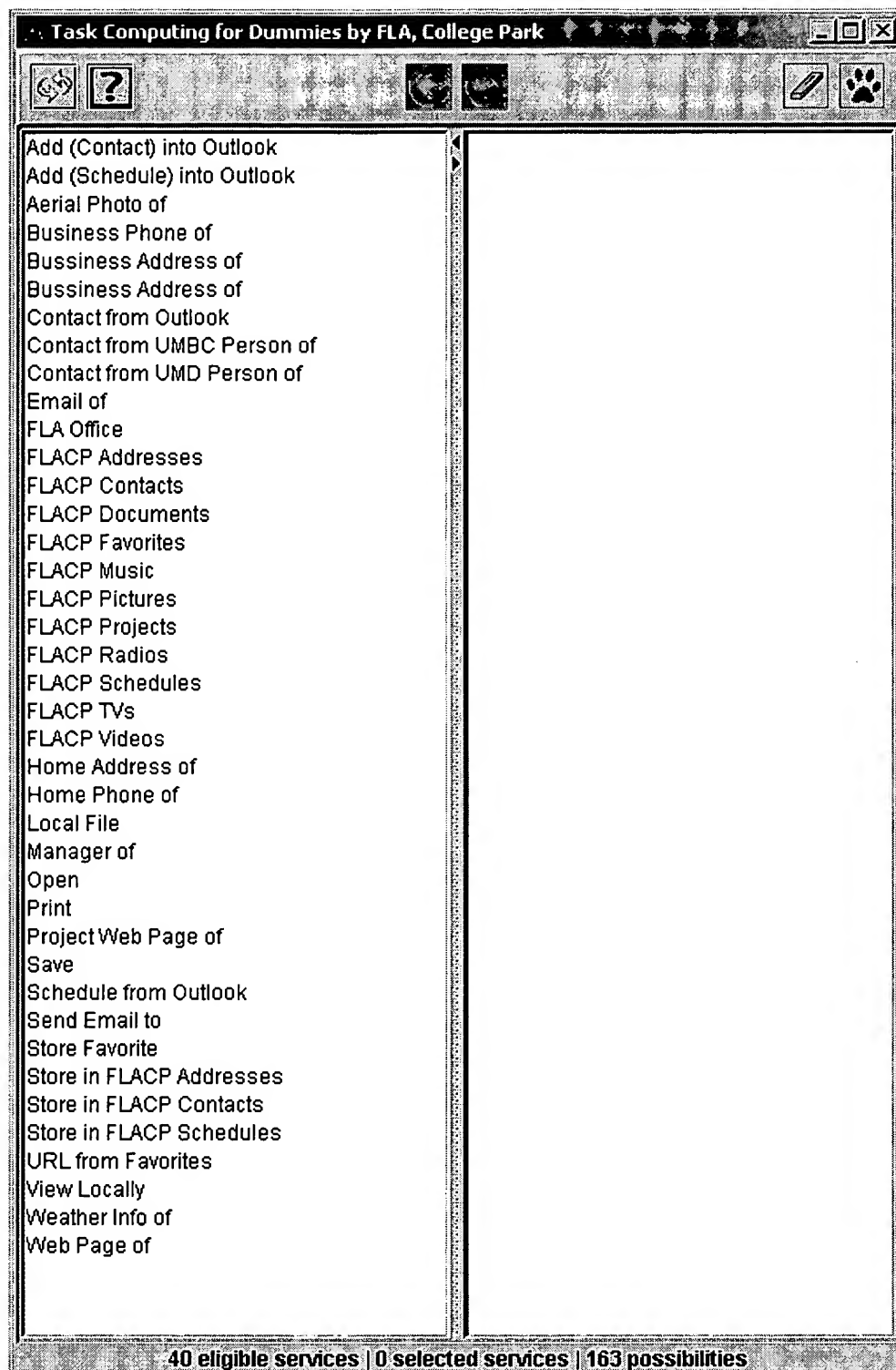


Figure 23 User Interface Flow Version (I) 2300

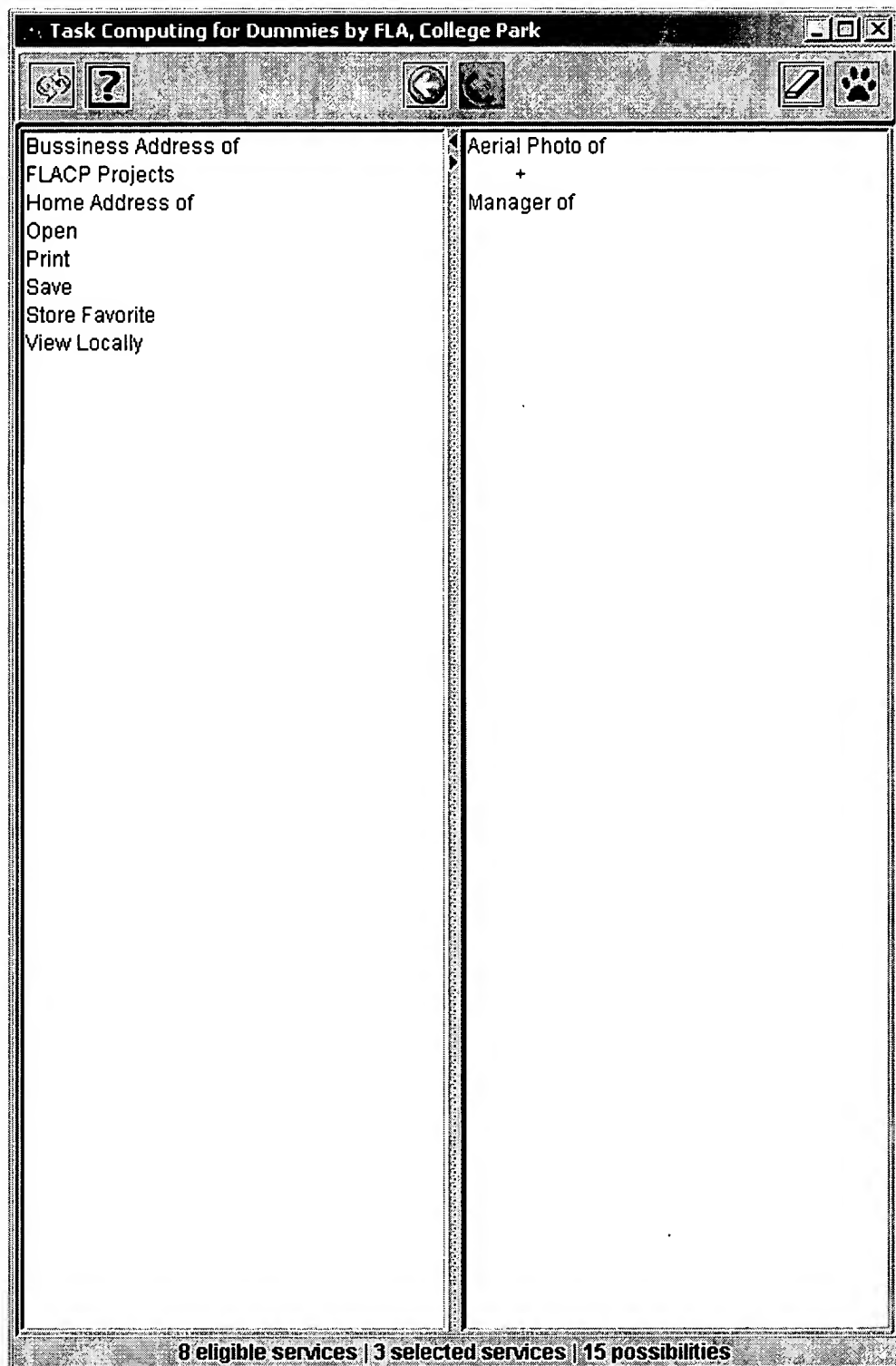


Figure 24 User Interface Flow Version (II) 2400

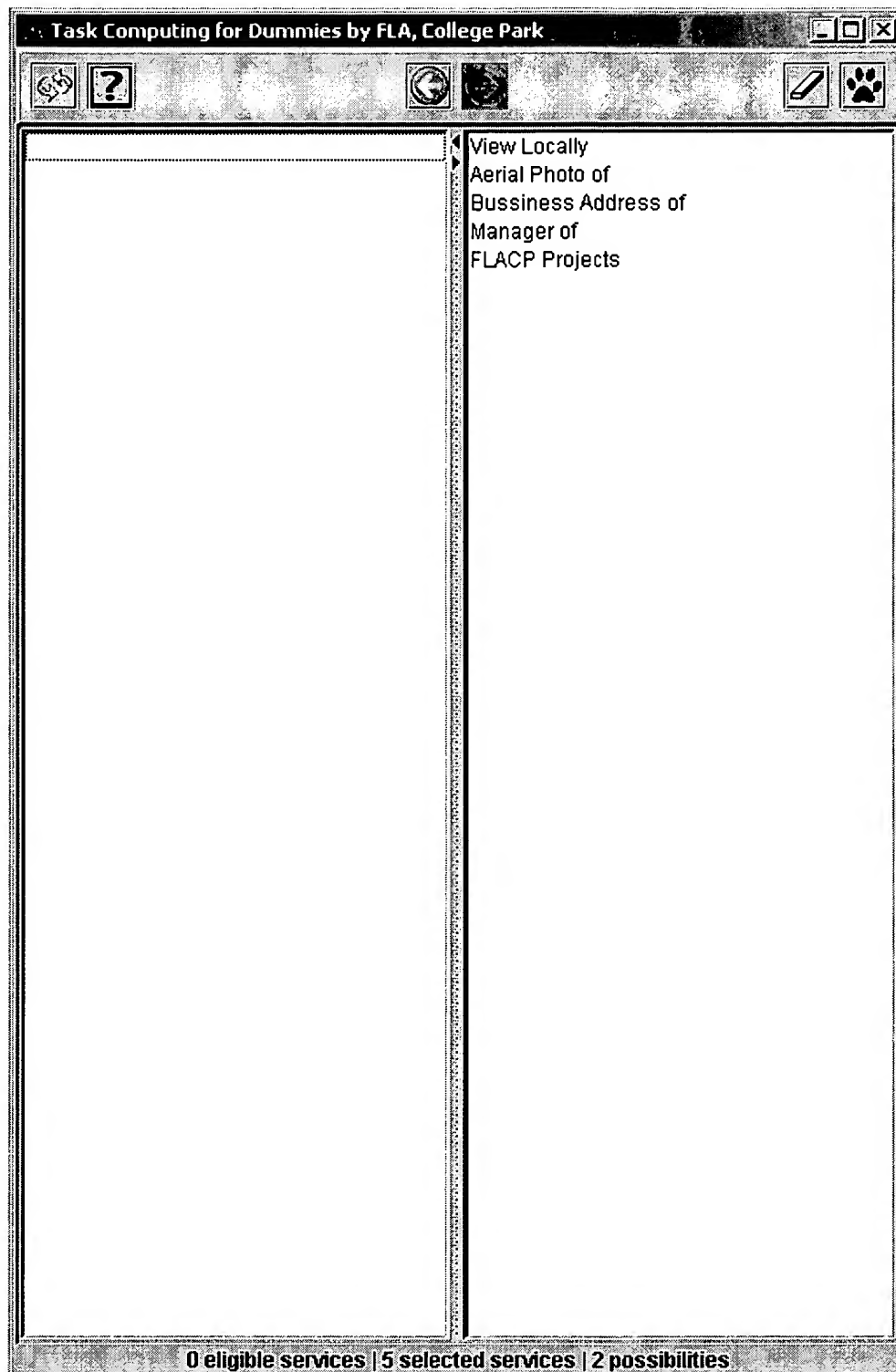


Figure 25 User Interface Flow Version (III) 2500

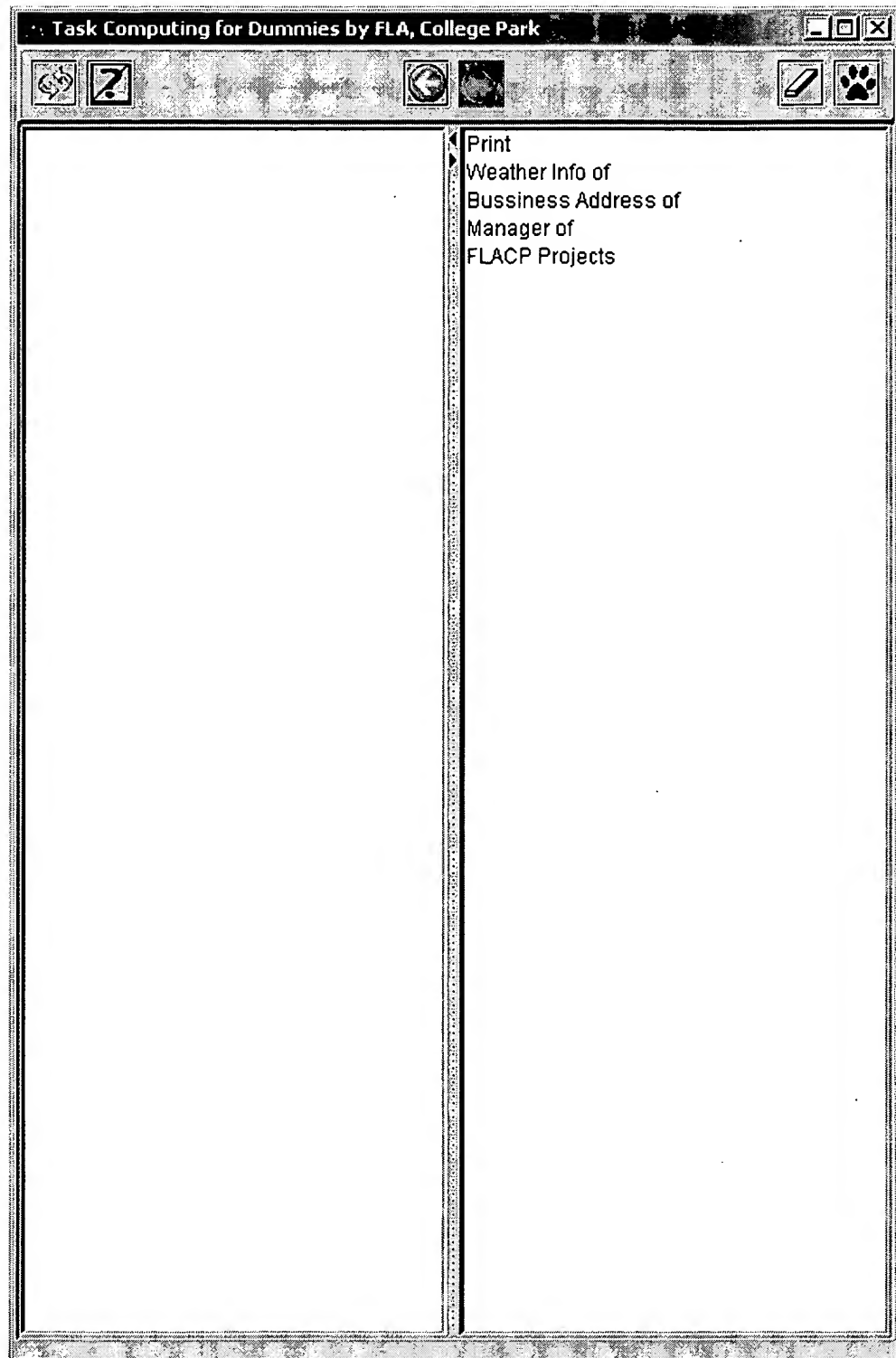


Figure 26 User Interface Flow Version (IV) 2600



Figure 27 At the Start 2700



Figure 28 After User Selection 2800

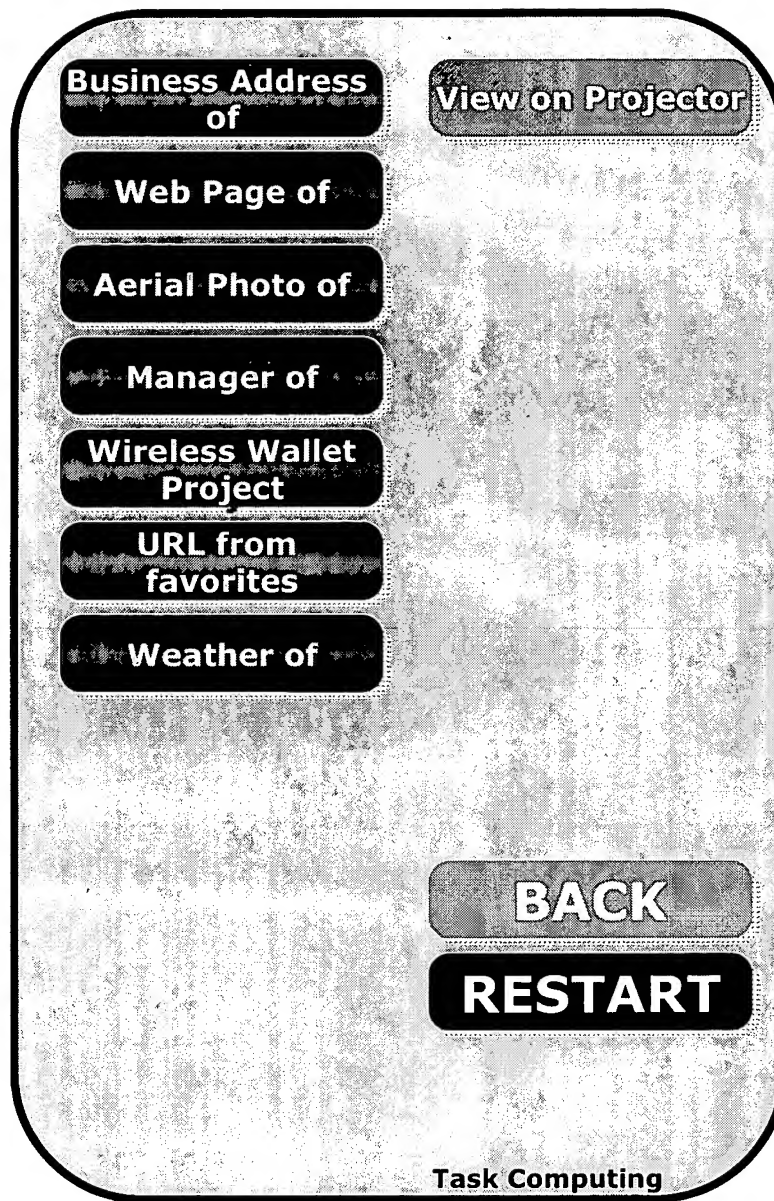


Figure 29 After Refreshing of Left Panel 2900

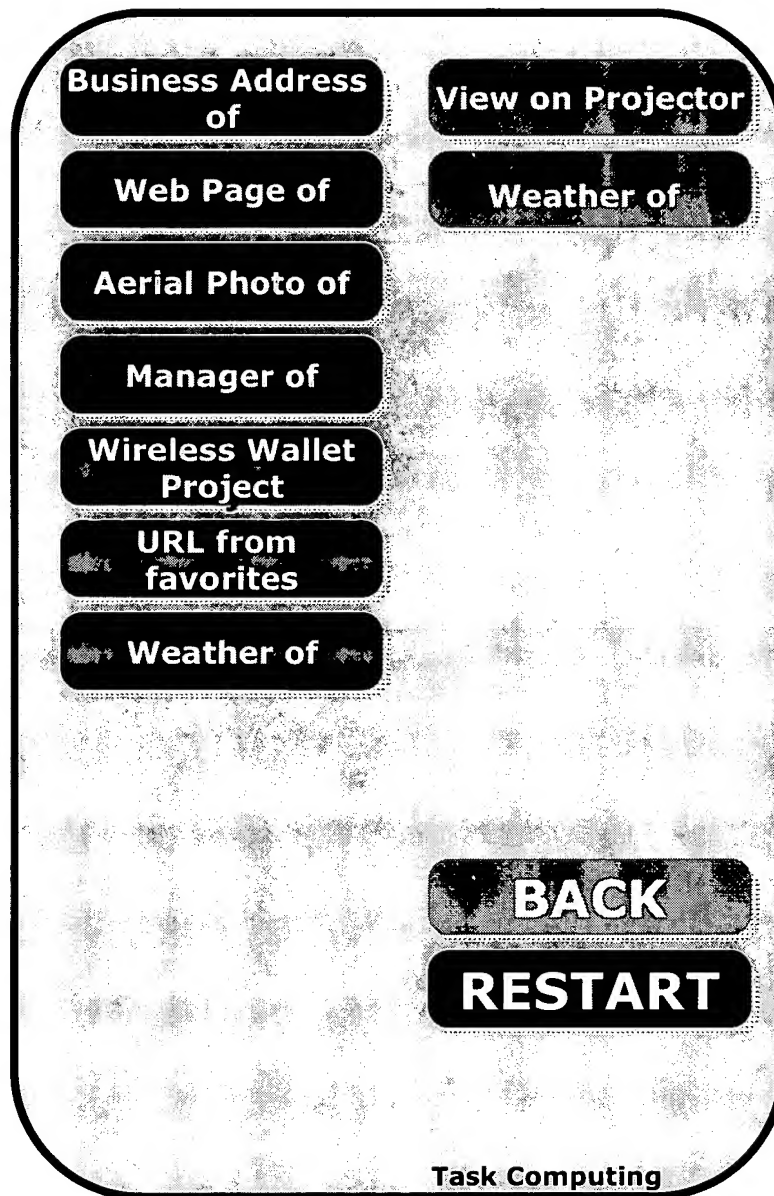


Figure 30 After User Selection 3000

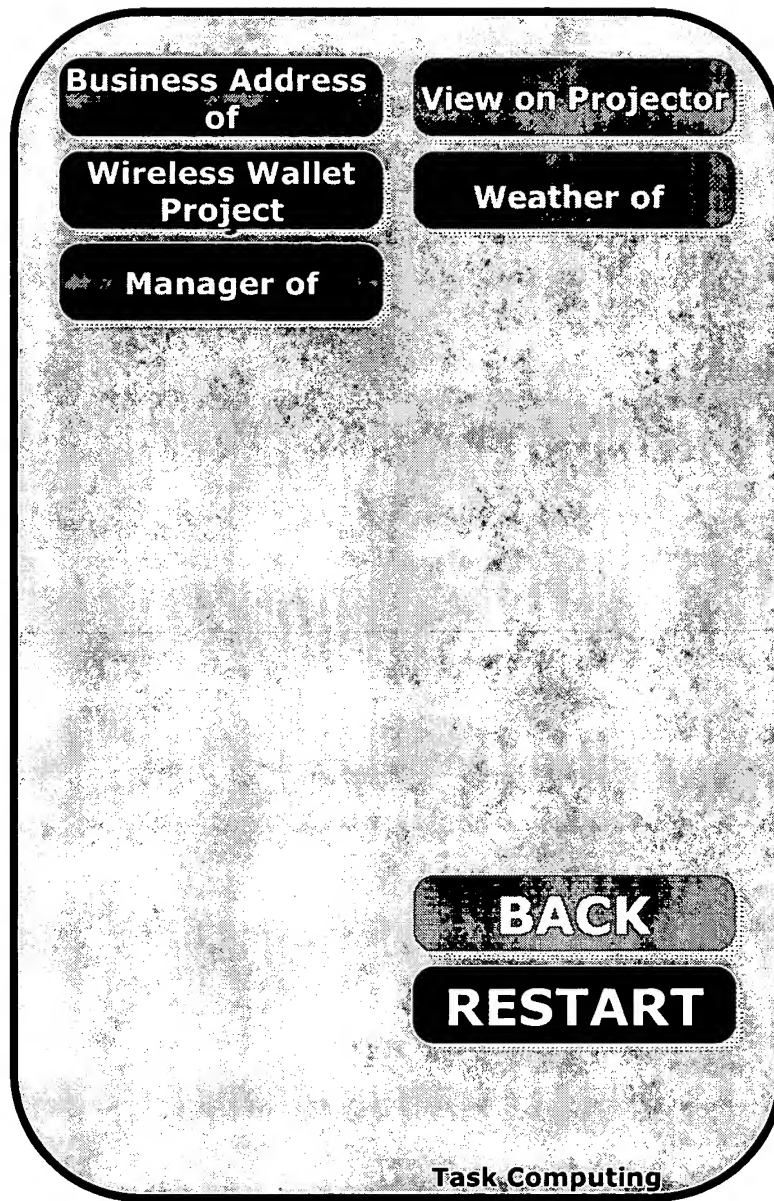


Figure 31 After Refreshing of Left Panel 3100

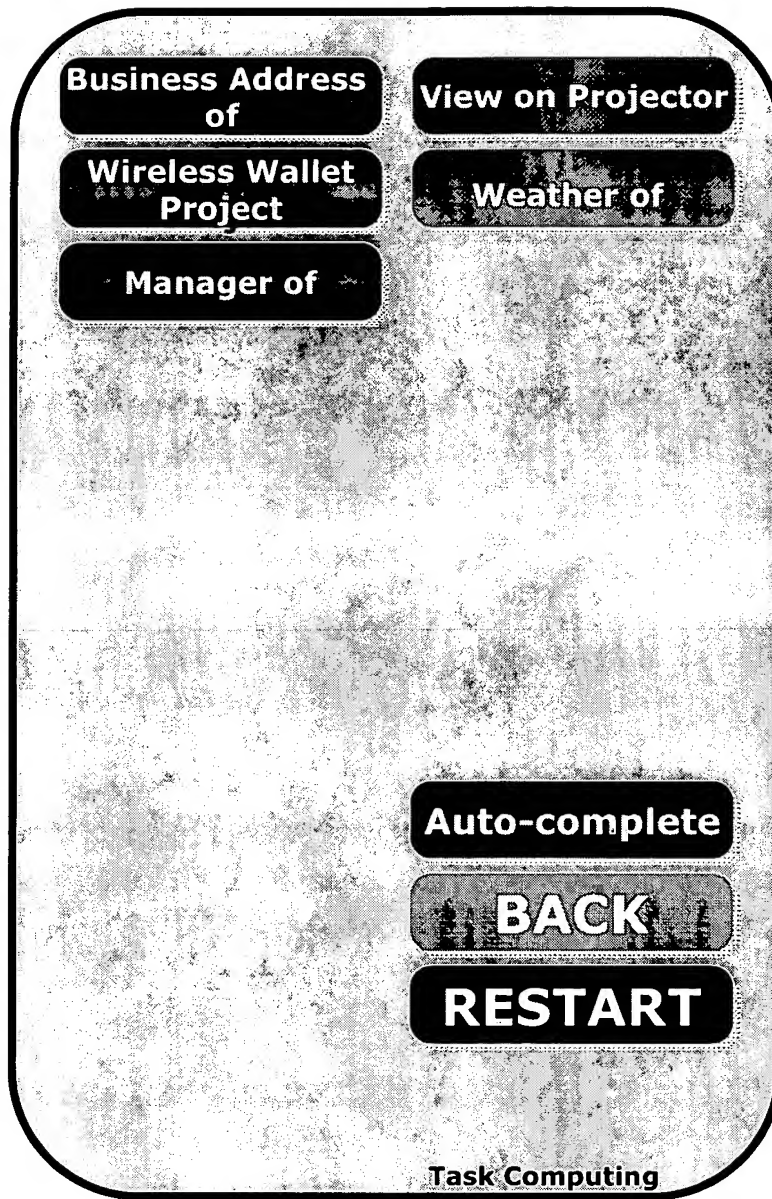


Figure 32 Auto-complete is Now Possible 3200

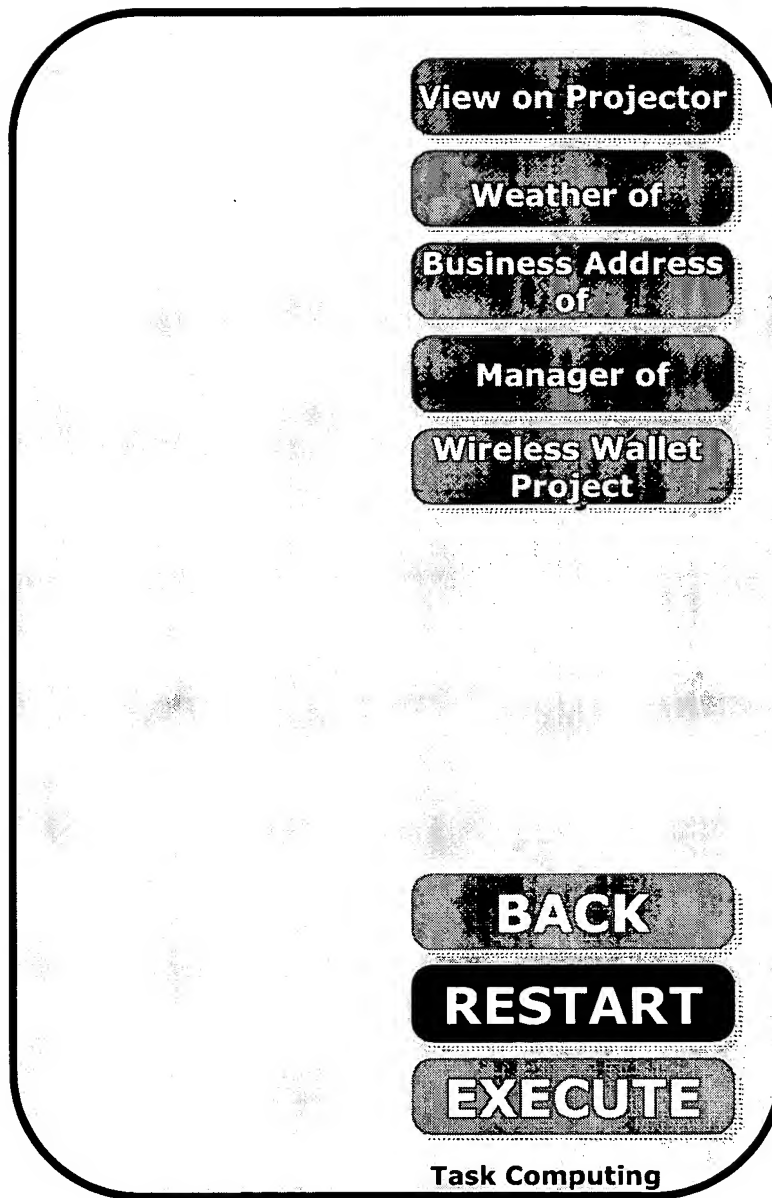


Figure 33 After User Selects Auto-complete; Alternatively if Auto Complete is Possibly, it Might be Done Automatically 3300

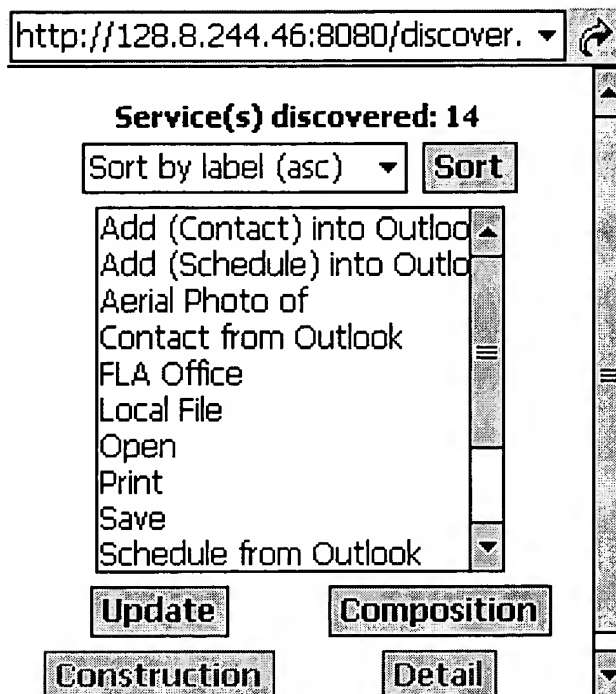


Figure 34 User Interface Web Version (I) 3400

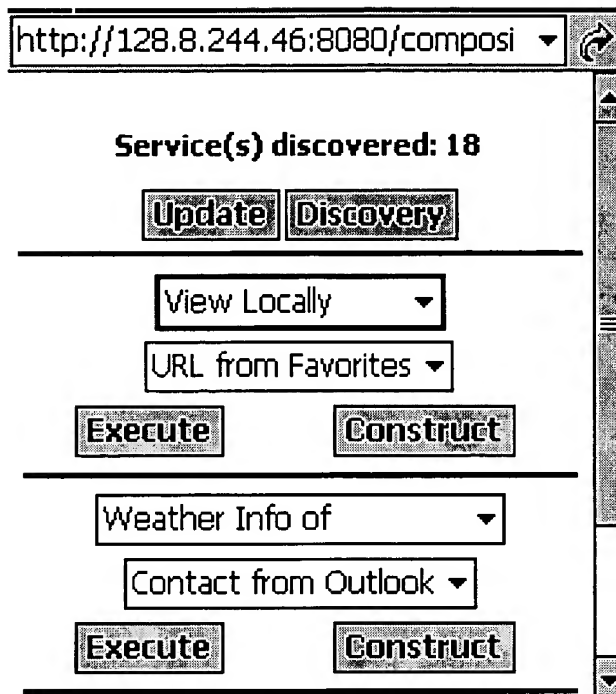



Figure 35 User Interface Web Version (II) 3500

http://128.8.244.46:8080/construc ▼ 

Execute

Save

Discovery

Composition

Add

Remove

Contact from Outlook ▼

Bussiness Address of ▼

Add

Remove

Figure 36 User Interface Web Version (III) 3600

http://128.8.244.46:8080/construc ▾

Execute

Save

Discovery

Composition

Add

Remove

Contact from Outlook ▾


Bussiness Address of ▾

Aerial Photo of ▾

Add

Remove

Figure 37 User Interface Web Version (IV) 3700

http://128.8.244.46:8080/execute ▼ 

Composition

Discovery

Execution List

-> Contact from Outlook
Business Address of
Aerial Photo of
Save

[View Execution Detail](#)

Figure 38 User Interface Web Version (V) 3800

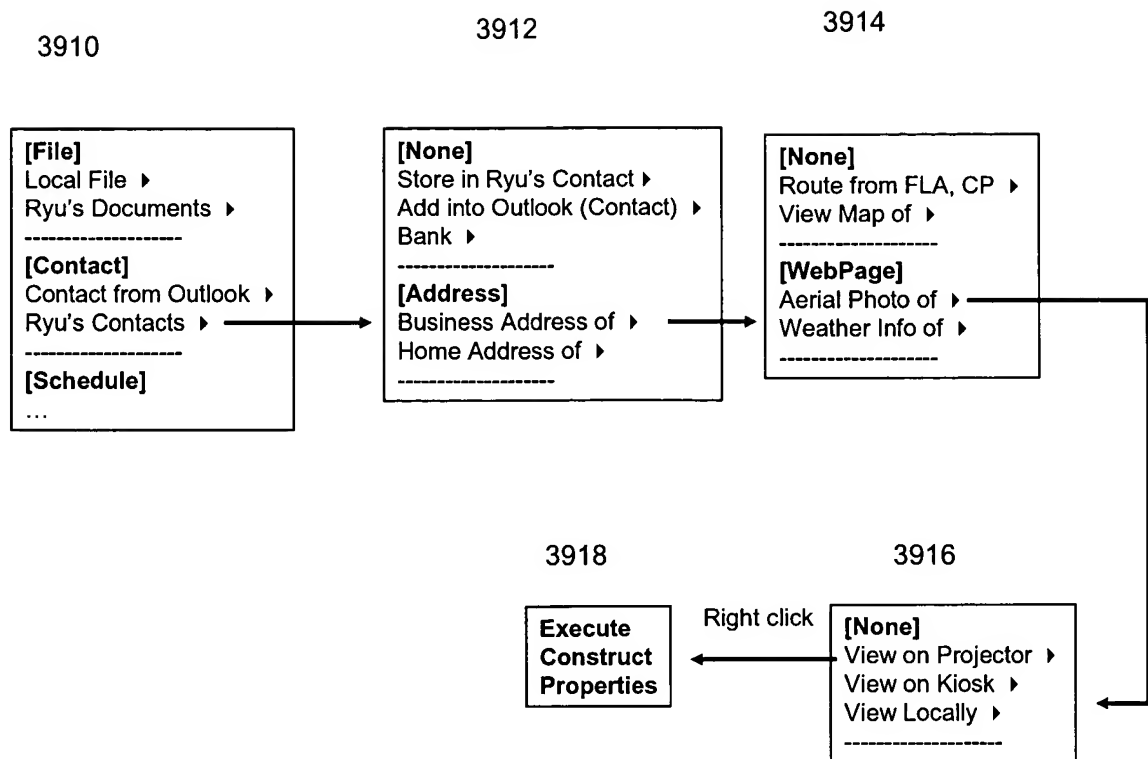


Figure 39 User Interface Nested Menu Version (I) 3900

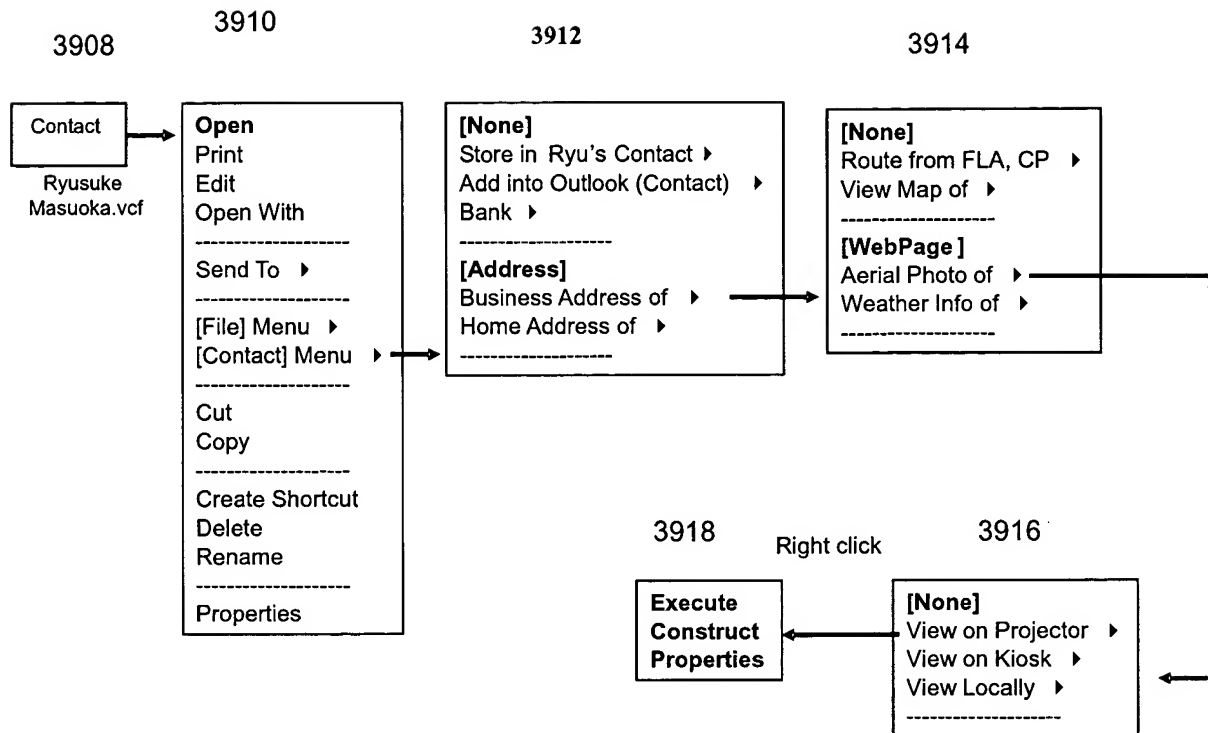


Figure 40 User Interface Nested Menu Version (II) 4000

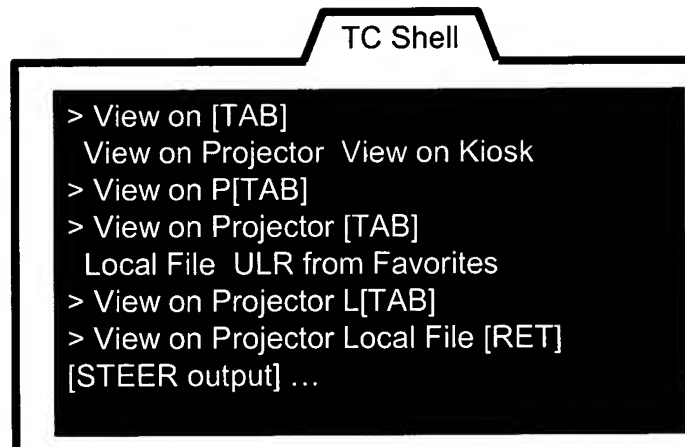


Figure 41 User Interface Command Line Version 4100

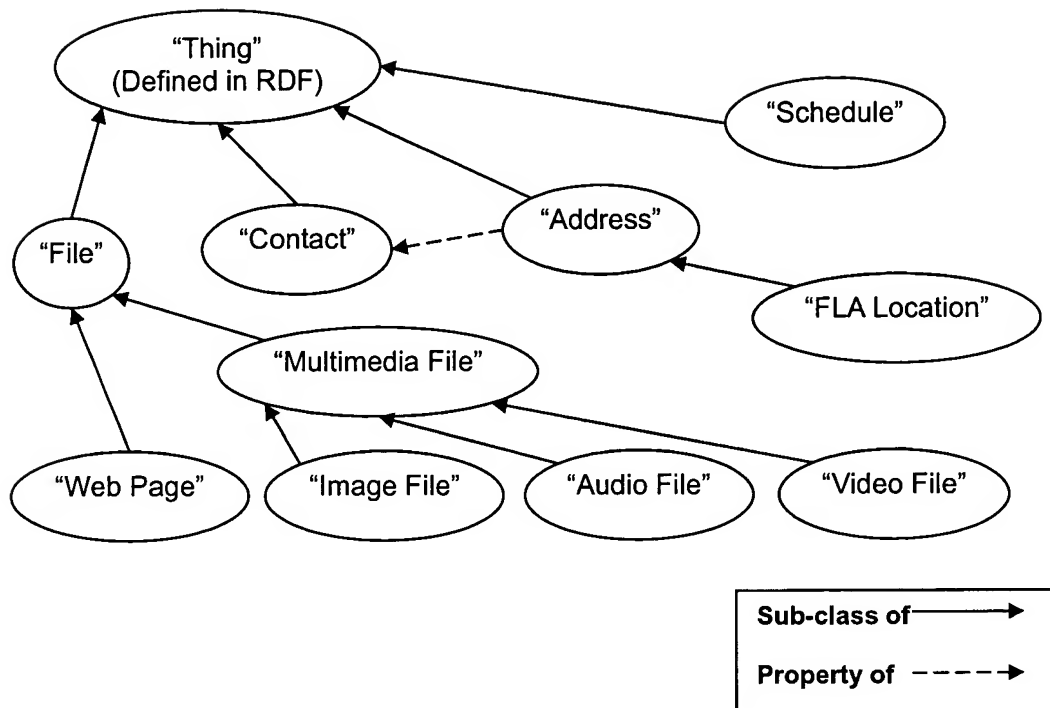


Figure 42 Relationship between Semantic Instance Types 4200

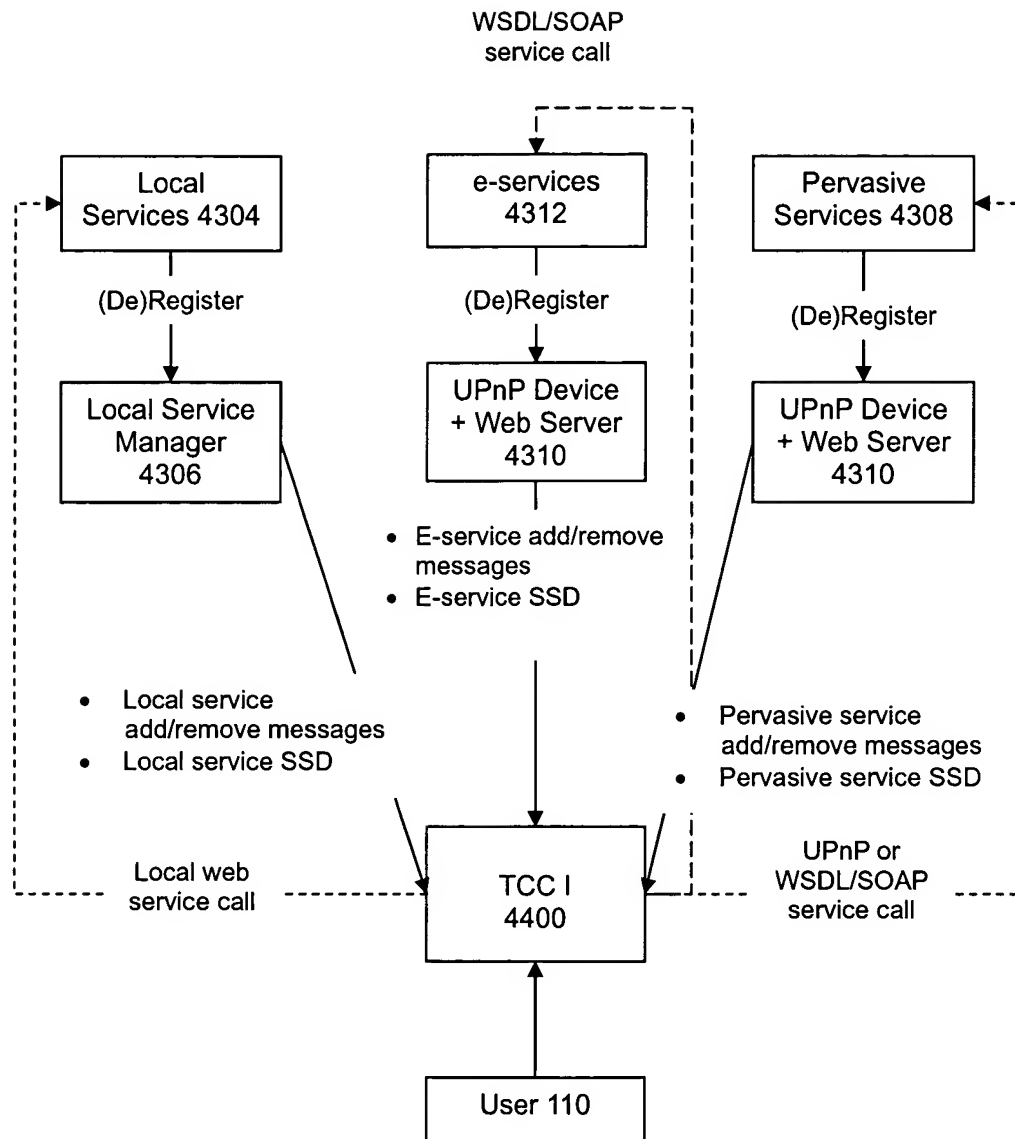


Figure 43 TCE Embodiment Architecture 4300

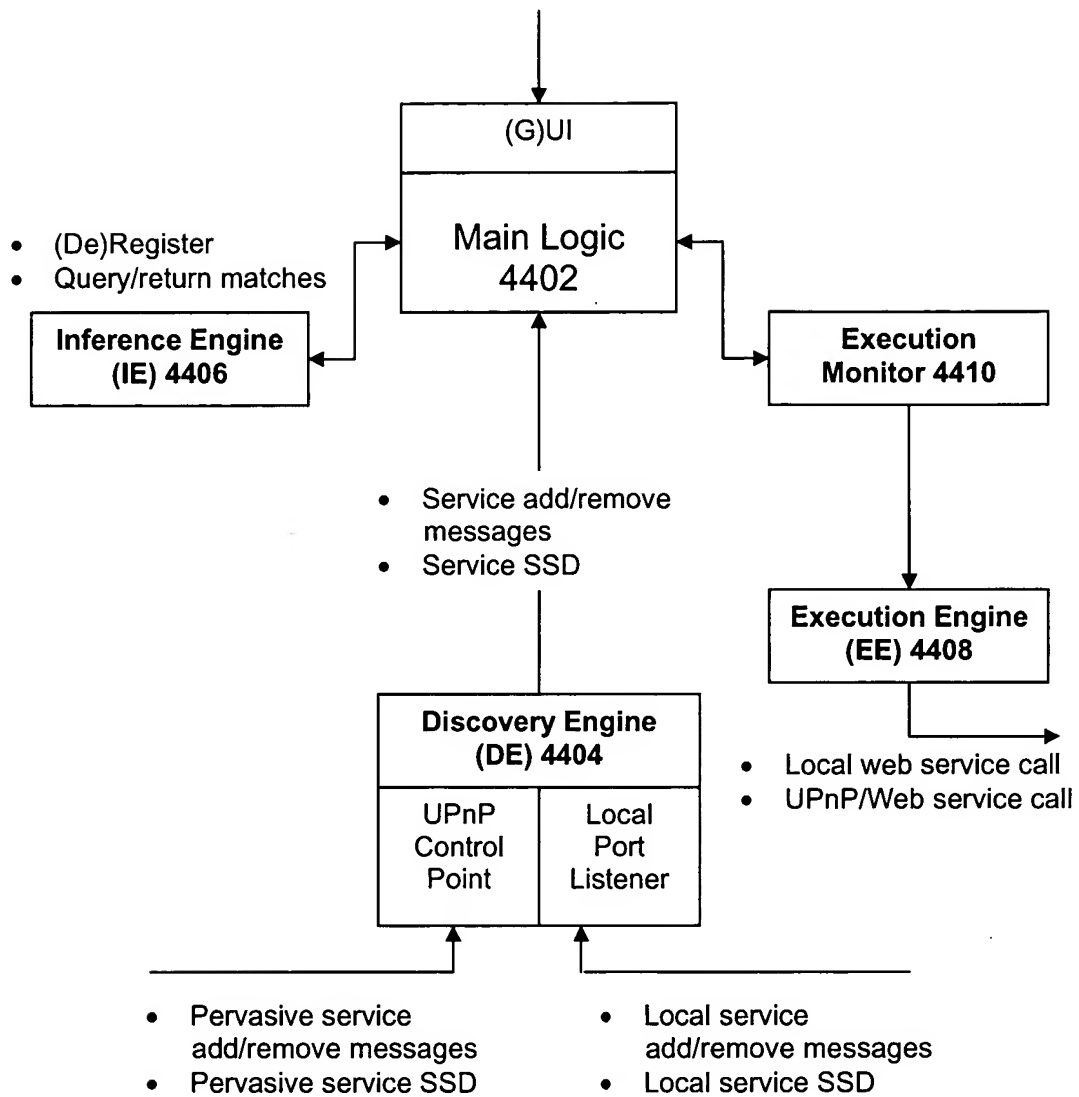


Figure 44 TCC I Internal Mechanism 4400

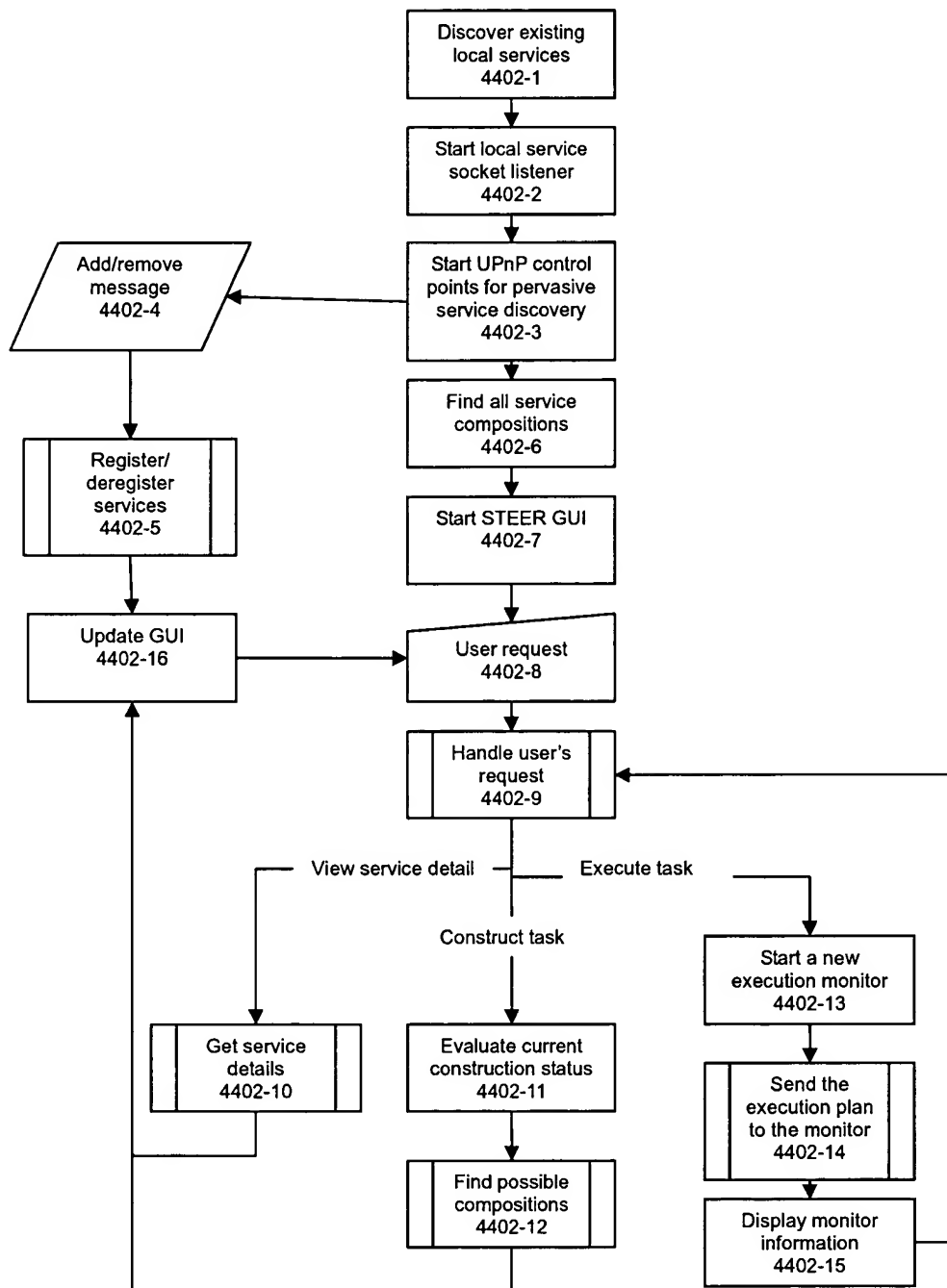


Figure 45 TCC I Main Logic 4402

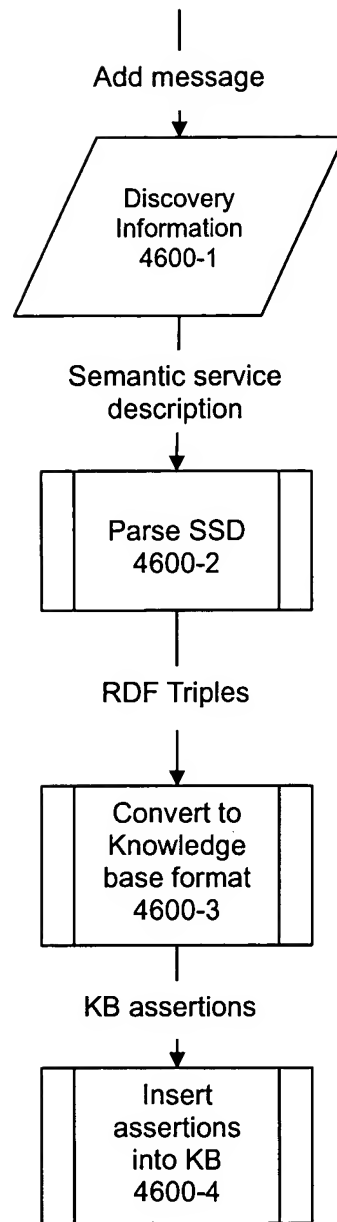




Figure 46 Discovery and Registration 4600 Using IE 4406

Service Filter: - No Filter - 

Local Services 

- Insert Contact into Outlook
- Display Locally
- Insert Schedule into Outlook
- Local URL Provider Service
- Local Favorite URL Provider Service

Pervasive Services

- Contact: Yannis Labrou
- Courtyard Address
- Contact: Ryusuke Masuoka
- Dulles Airport Address
- L-Note Viewer
- LSM Location Provider
- BWI Airport Address**
- McDonalds Address

Figure 47Discovery Pane - 4700

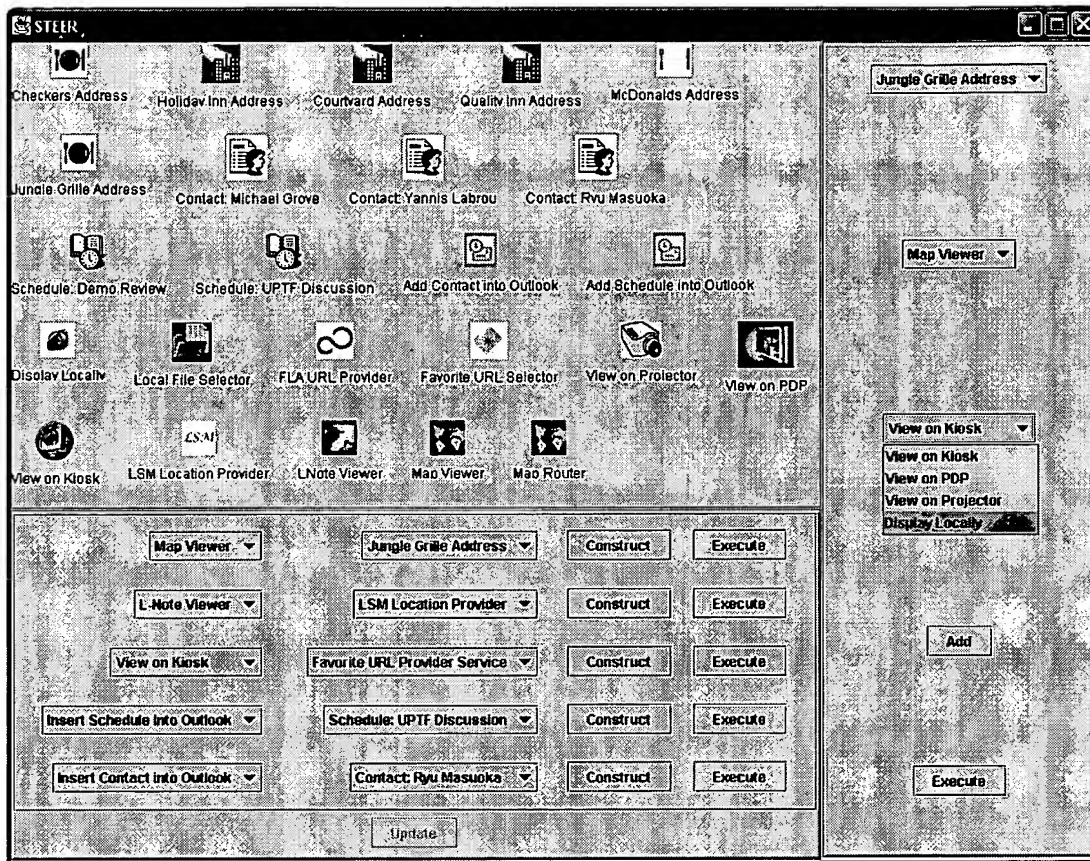


Figure 48 Discovery Pane with Icons for the Services 4800

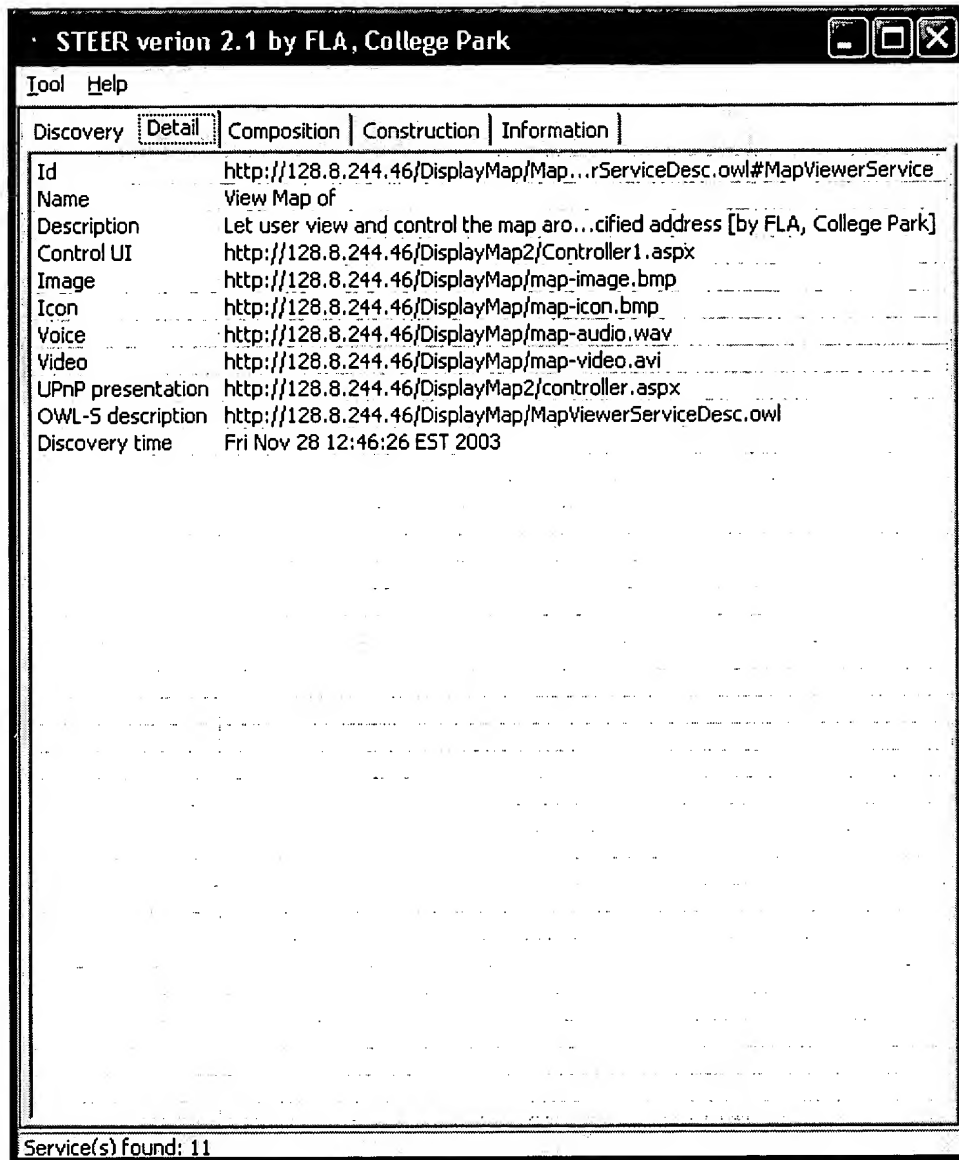


Figure 49 Detail Pane 4900

DiscoverUpdate

Service Filter: Filter by Location Room Current Location: Conference Room
Add Filter

Map Viewer
Dulles Airport Address
ExecuteConstruct

Figure 50 Service Filtering 5000

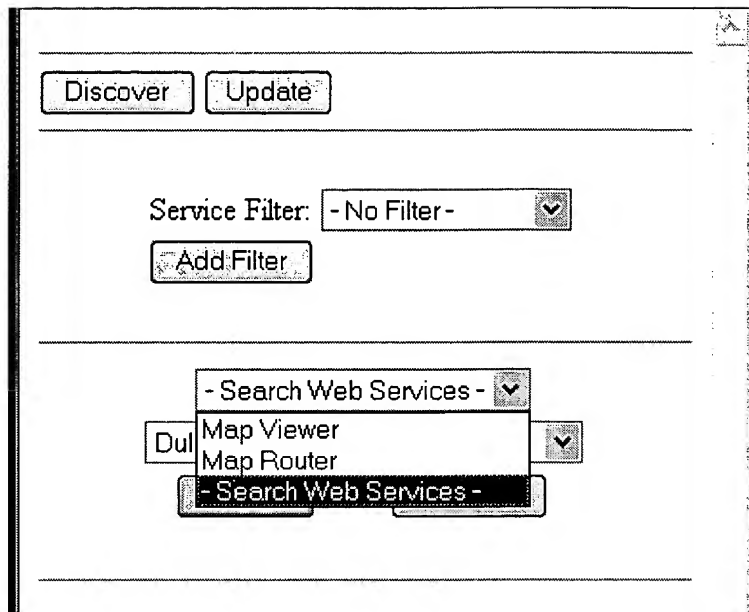


Figure 51 Discovery Pane shown with "Search Web Services" 5100

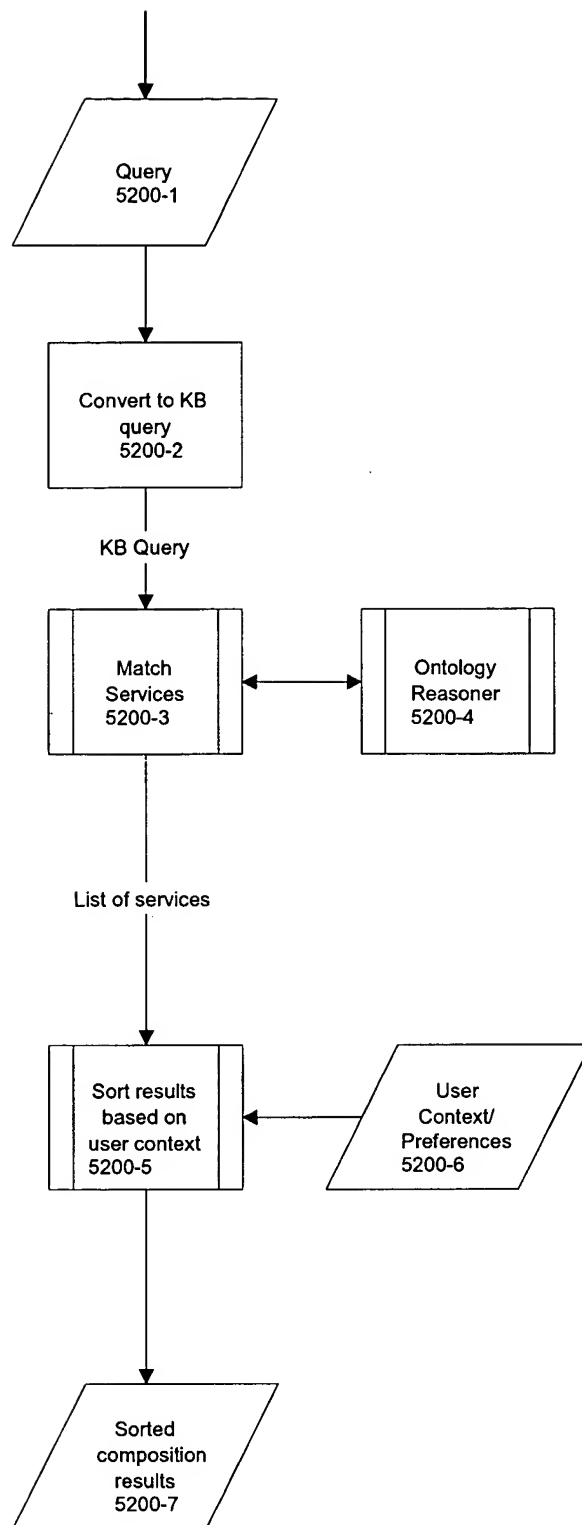


Figure 52 Find Compositions 5200 Using the IE 4406

DiscoverUpdate

Service Filter: - No Filter -
Add Filter

Map Viewer
Dulles Airport Address
ExecuteConstruct

Total:
Fee: \$2.84
Est. time: 00:39

L-Note Viewer
LSM Location Provider
ExecuteConstruct

Display Locally
FLA URL Provider
ExecuteConstruct

Insert Contact into Outlook
Contact: Ryusuke Masuoka
ExecuteConstruct

DiscoveryUpdate

Figure 53 Composition Pane 5300

Service Filter: - No Filter -

Add Filter

Add Service

[- None -]

FLA URL Provider Remove Service

[- URL -] Add Service

Display Locally Remove Service

[- Control URL -]

Add Service

Execute Save

Discovery Compose

Figure 54 Construction Pane 5400

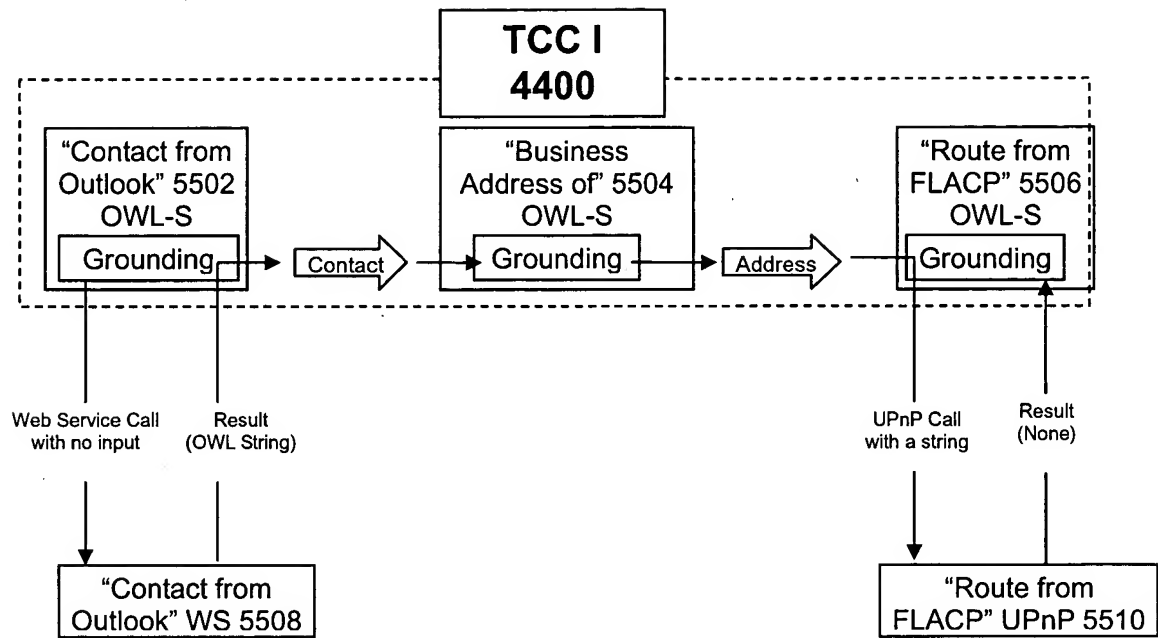


Figure 55 Task Execution in Semantic Layer and Syntactic Layer 5500

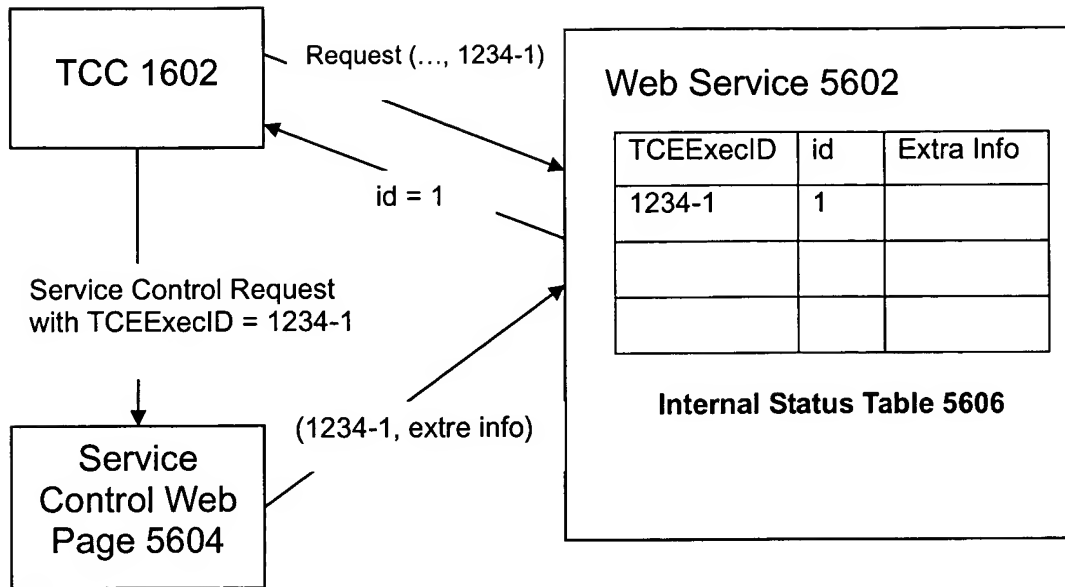


Figure 56 Invocation of Web Service with Web Server Support 5600

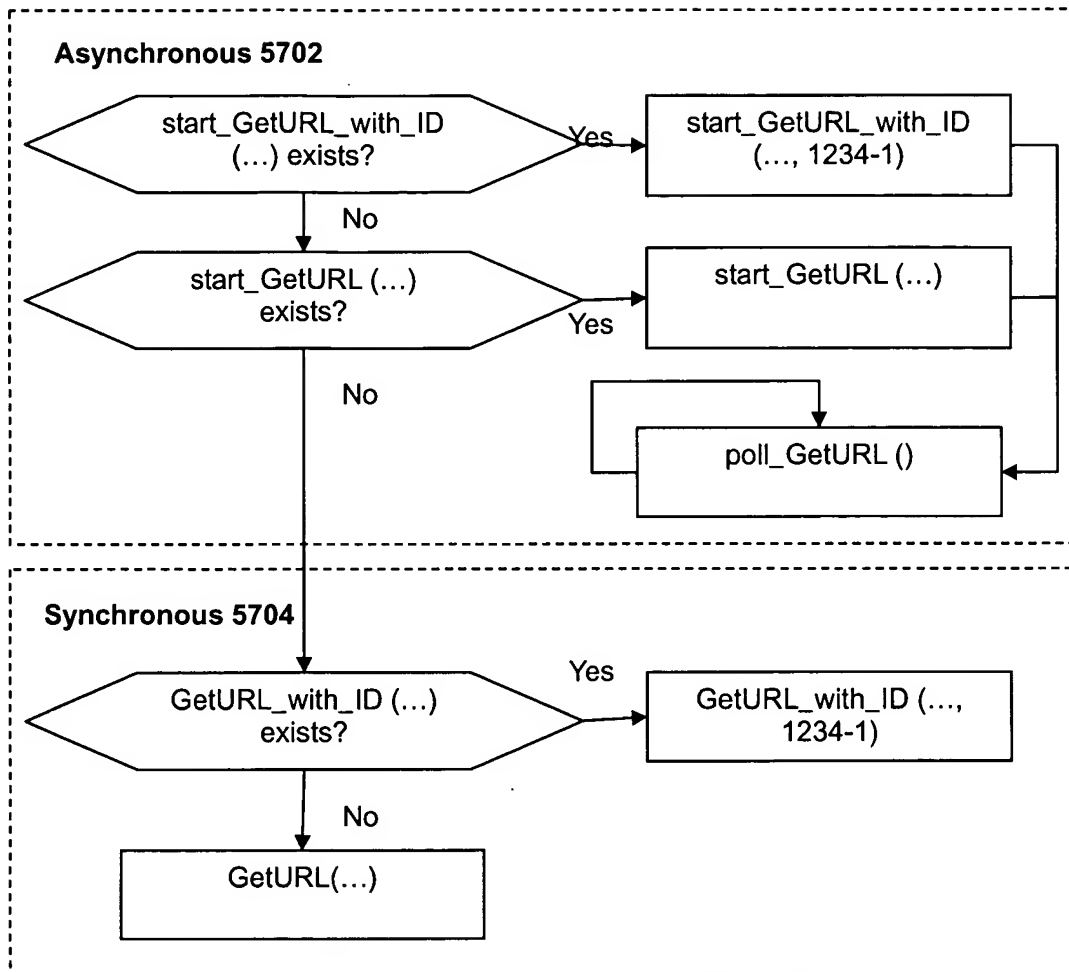



Figure 57 Service Invocation Flowchart 5700 of TCC I 4400

http://128.8.244.46:8080/execute ▾ 

Composition **Discovery**

Execution List

-> Jeff's File

View on Browser

View Execution Detail

Figure 58 Web-based UI with Service Control UI (I) 5800

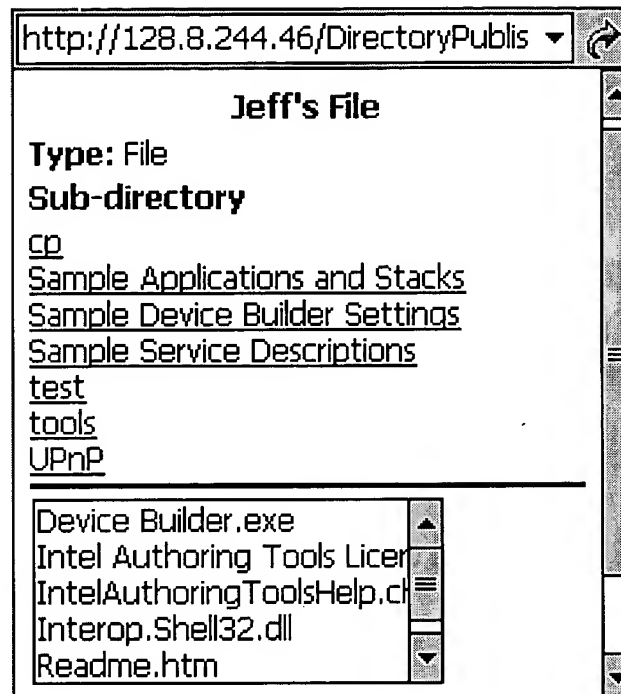


Figure 59 Web-based UI with Service Control UI (II) **5900**

http://128.8.244.46:8080/execute ▾ 

Composition **Discovery**

Execution List

Done Jeff's File

Done [View on Browser](#)

[View Execution Detail](#)

Figure 60 Web-based UI with Service Control UI (III) 6000

Done Executing:

User Input: Enter Book Title

Currently Executing: Amazon Book Search

Still to Execute:

Verify Credit Card
Confirm Order
Complete Order

UpdateSave

ReconstructDiscoveryCompose

Figure 61 Monitor Pane 6100

Inputs:

- None -

Add Service

[- None -]

Local File Selector Exact Match: ☒

[- Local File (File) -] Add Service

View On Projector Exact Match: ☐ Min Resolution: 1024 x 768

Max Resolution: x Brand: - Any -

[- Control URL (URL) -] Add Service

Display Locally Exact Match: ☒

[- None -]

Add Service

Outputs:

- None -

Name: Present slides

Text Description:

Present the PowerPoint slides on the projector available in the room.

Save Cancel

Discovery Compose

Figure 62 Save Pane 6200

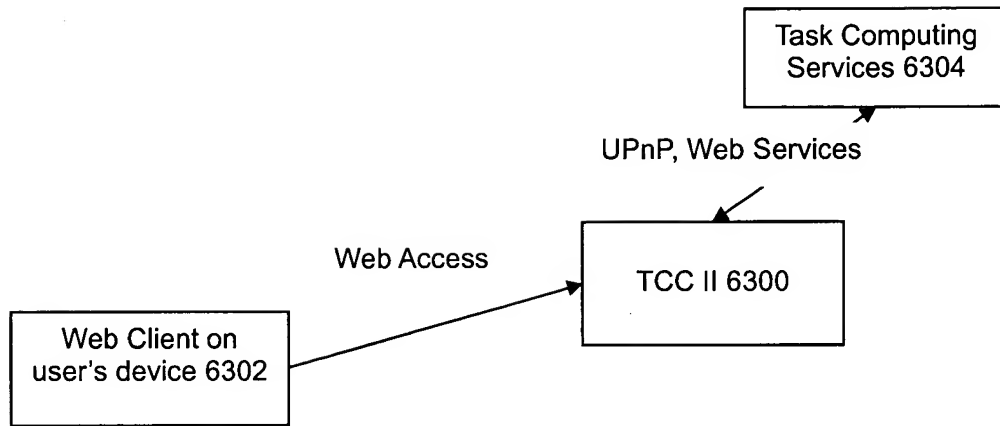


Figure 63 TCC II 6300

```

...
<!-- Profile description -->

<profile:ServiceProfile rdf:ID="ProjectorProfile">
  <service:isPresentedBy rdf:resource="#ProjectorService"/>

  <profile:serviceName encoding="en">
    View on Projector</profile:serviceName>
  <profile:serviceName encoding="jp">
    プロジェクタで表示する</profile:serviceName>

  <profile:textDescription encoding="en">
    Lets you view the specified URL on the Projector
    in the conference room</profile:textDescription>
  <profile:textDescription encoding="jp">
    会議室のプロジェクタで指定された URL を表示し、
    コントロールする
  </profile:textDescription>


...

```

Figure 64 Multiple Natural Language Support in SSD 6400


FLA Bank Service

For Deposit

File Type: 

Target URL:

Service Name:

Time Out: 

Current Available Services

Actions	File Type	Service Name	Original URL	Deposite Time	Time out	Unit
<input type="checkbox"/> M <input type="checkbox"/> D	File	Photo (Mexico Trip)	http://128.8.244.13/P237.jpg	12/13/2002 6:29:23 PM	10	Day (s)
<input type="checkbox"/> M <input type="checkbox"/> D	Favorite	Yahoo Home	http://www.yahoo.com	12/13/2002 6:29:41 PM	365	Day (s)
<input type="checkbox"/> M <input type="checkbox"/> D	Contact	Contact for Sam Chen	http://128.8.244.37/Sam.daml	12/13/2002 6:30:05 PM	30	Day (s)
<input type="checkbox"/> M <input type="checkbox"/> D	Schedule	Office Admin Meeting (12/17/02)	http://128.8.244.33/OAM.daml	12/13/2002 6:31:25 PM	5	Day (s)

Figure 65 Bank Service 6500

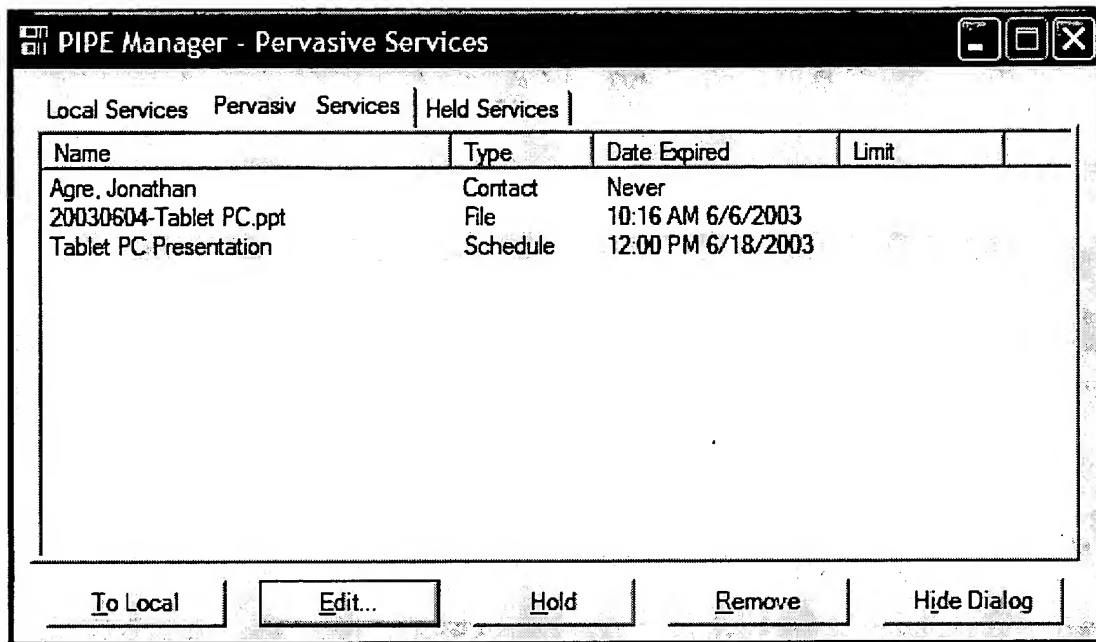


Figure 66 PIPE Manager 6600



Figure 67 White Hole Drag & Drop Interface 6700

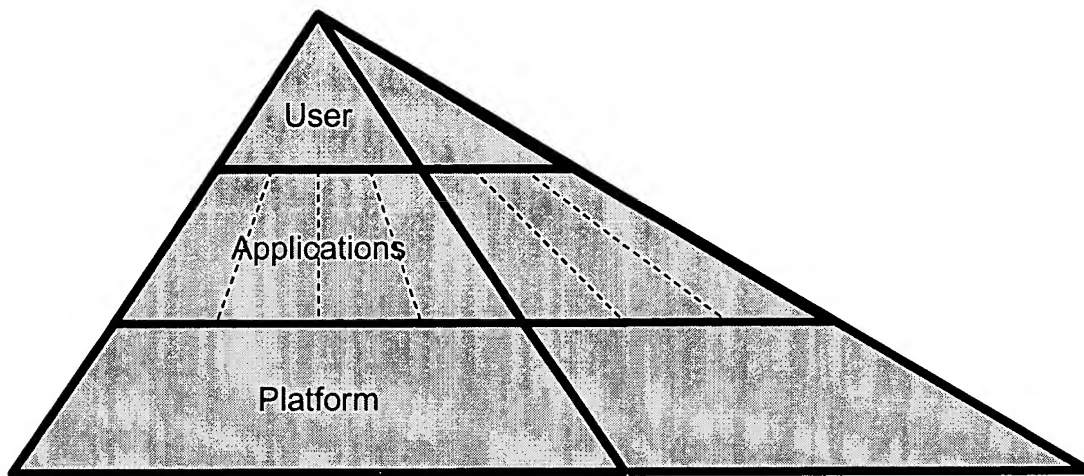


Figure 68 Capability Pyramid before Task Computing 6800

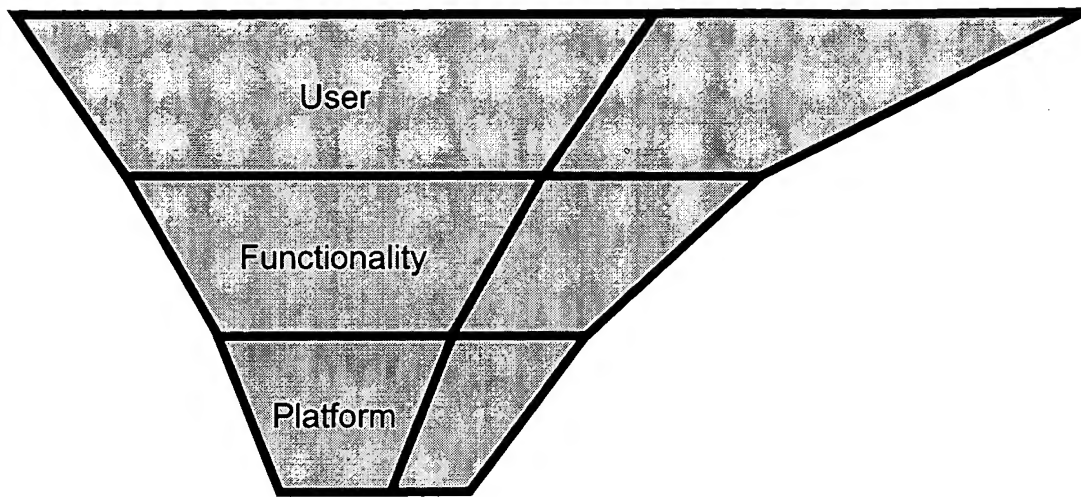


Figure 69 Inversed Capability Pyramid after Task Computing 6900

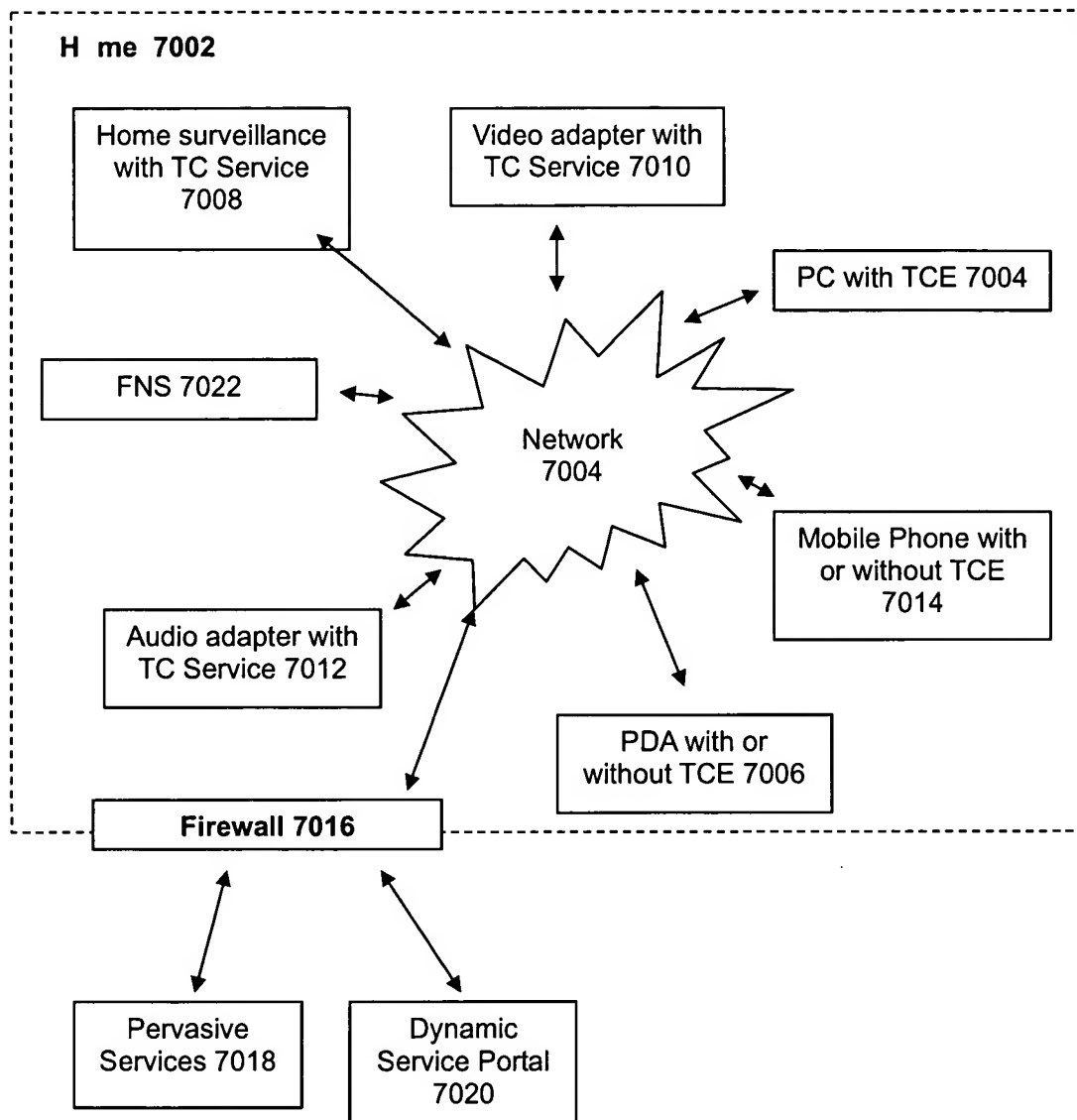


Figure 70 Application eHome 7000

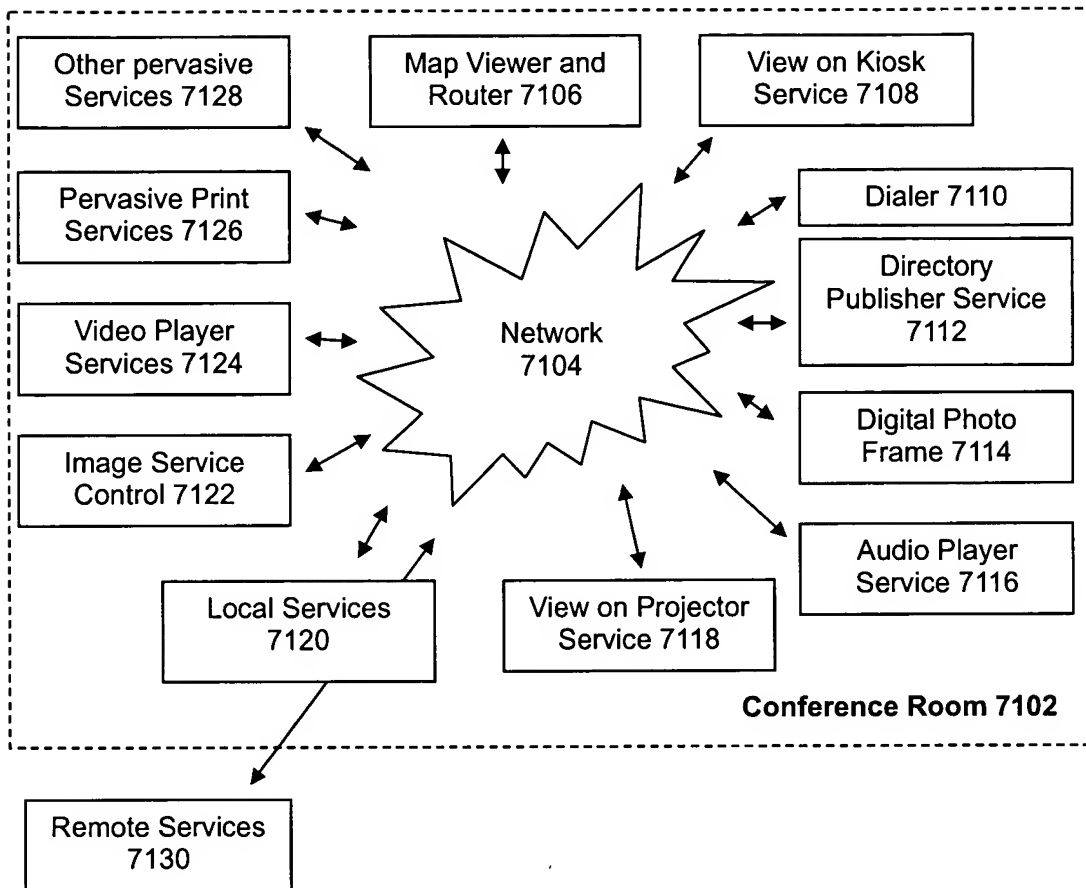


Figure 71 Application eOffice 7100

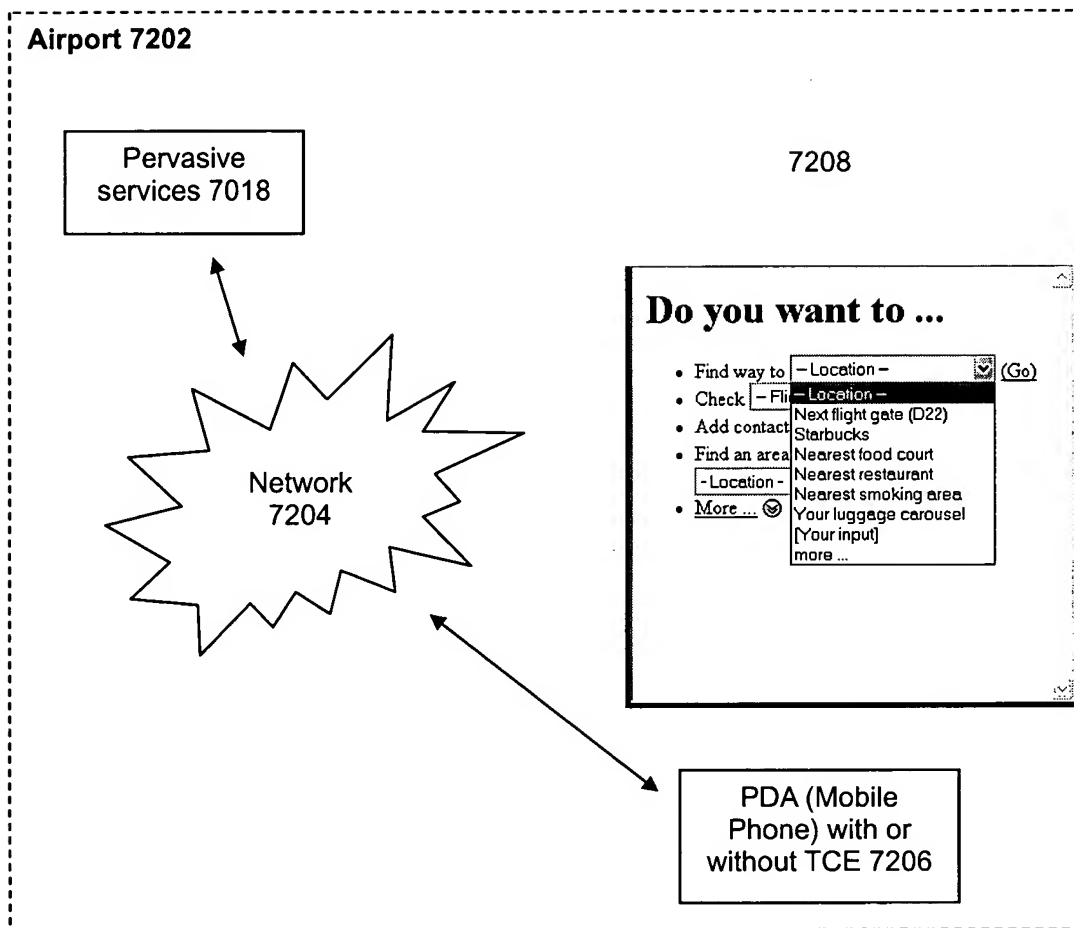


Figure 72 Application Airport 7200

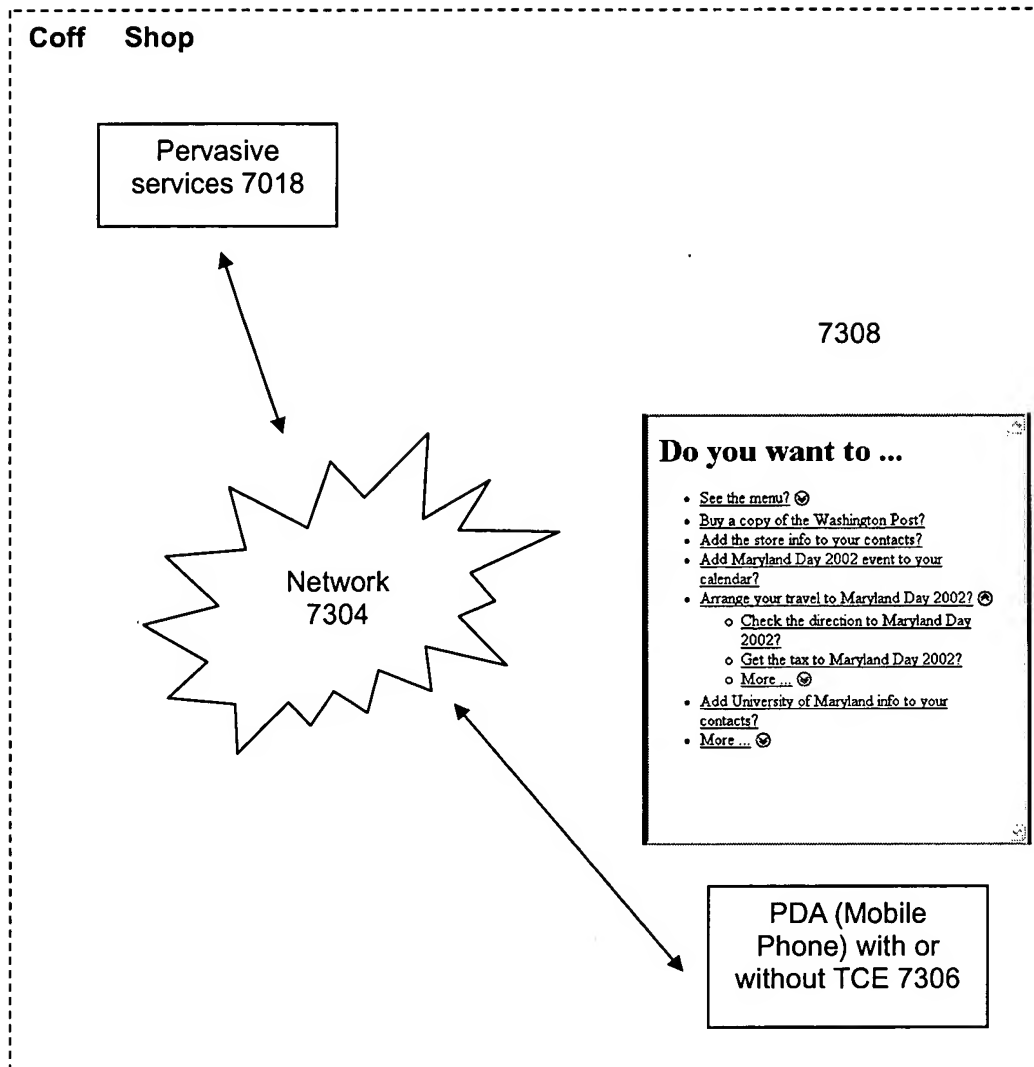


Figure 73 Application Coffee Shop 7300

In this page you can find the following:

an *Event* of type *Talk* with
Title: Signs of the Times: Information Technology in A Cautious Economy
Speaker: Kathleen Hayes
on **Date:** Tuesday, May 14, 2002
with **Starting Time** of 08:00 AM
and **Ending Time** of 10:00 AM
at **Location** Baltimore Marriott Waterfront

☒ Would you like to *find the address* of **Baltimore Marriott Waterfront**

☐ Would you like to *add event to*

☐ Would you like to *send a note about this event to*

☐ Would you like to *find events* of type *talk* by *speaker* **Kathleen Hayes**

☐ Would you like to find events of type *talk* at *location* **Baltimore Marriott Waterfront**

Figure 74 The TCE Identifies what is been Described at the Webpage and Suggests to the User Some Possible Actions Given the Current Content and Context 7400

In this page you can find the following:

an *Event* of type *Talk* with

Title: Signs of the Times: Information Technology in A Cautious Economy

Speaker: Kathleen Hayes

on *Date:* Tuesday, May 14, 2002

with *Starting Time* of 08:00 AM

and *Ending Time* of 10:00 AM

at *Location* Baltimore Marriott Waterfront

with address 700 Aliceanna Street, Baltimore, MD 21202

-
- ☒ Would you like to *see directions* to Baltimore Marriott Waterfront from
- ☐ Would you like to *find* *close to* Baltimore Marriott Waterfront
- ☐ Would you like to *add event to*
- ☐ Would you like to *send a note about this event to*
- ☐ Would you like to *find events* of type *talk* by *speaker* Kathleen Hayes
- ☐ Would you like to *find events* of type *talk* at *location* Baltimore Marriott Waterfront

You can save your actions so far as a task. Choose a name for this task

Figure 75 After the User Chose to Find the Address of the Location of the Talk First, TCE Finds the Address and Presents the User with a New List of Possible Actions 7500

In this page you can find the following:

an Event of type *Talk* with
Title: Signs of the Times: Information Technology in A Cautious Economy
Speaker: Kathleen Hayes
on **Date:** Tuesday, May 14, 2002
with **Starting Time** of 08:00 AM
and **Ending Time** of 10:00 AM
at **Location** Baltimore Marriott Waterfront
with address 700 Aliceanna Street, Baltimore, MD 21202

☒ Would you like to add add event to MS Outlook
☒ include directions to Baltimore Marriott Waterfront from your home

☒ Would you like to send a note about this event to Ryu Masuoka
☒ include directions to Baltimore Marriott Waterfront from FLA - College Park

☐ Would you like to find events of type *talk* by speaker Kathleen Hayes

☐ Would you like to find events of type *talk* at location Baltimore Marriott Waterfront

☐ Would you like to just see directions to Baltimore Marriott Waterfront from location

☐ Would you like to find places of interest close to Baltimore Marriott Waterfront

You can save your actions so far as a task. Choose a name for this task

Figure 76 After the User Selected to Check the Location of the Address of the Location of the Talk on the Map, TCE Presents a Revised List of Actions with the Option to Save User's Actions up to This Point as a New Task for Future (re-)Use 7600